American Machinist

New York, July 15, 1926

Shop Equipment Review

Semi-Annual résumé of machines, tools and accessories described in the Shop Equipment News section of the American Machinist during the first six months of 1926

Principal Developments in Shop Equipment

THE seventh semi-annual Shop Equipment Review number of the *American Machinist* covers, in the American section, 289, and in the European section, 80 machines and pieces of equipment brought out during the six months ending June 30, 1926. The period has witnessed the development of many improvements in previous lines of equipment and some new models that promise to reduce production times and to improve the quality of the product.

Notable especially is the increased use of anti-friction bearings in the construction of the new and improved lines. As an example, two new lines of turret lathes and a line of milling machines can be taken. Some heavy equipment has been placed on the market chiefly for railroad purposes. This will be mentioned below, in more detail, under the various classifications. The increasing popularity of individual motor drive, as evidenced by its use in a number of improved models, has stimulated the development of electrical accessories for industrial purposes.

Two large boring mills have been built, one a 96-in. machine for locomotive wheel tires and the other a 32-ft. machine intended for work on large castings such as turbine housings. A 48-in. car-wheel boring machine has also been developed.

The manufacturers of upright drills have shown increased activity and some new models have been placed on the market. A line of special horizontal multiple-spindle drills primarily for drilling, boring and reaming automobile piston pin holes has also been developed. These are of double-end construction.

The development of disk grinding, both horizontal and vertical, has continued through this period and new models have been added to the lines of similar equipment built by grinding equipment manufacturers. Several internal grinding machines are included in this division. Two have been designed for large-bore cylinders. Ten tool and cutter grinders have been placed on the market recently, one of them being a fully automatic machine for grinding the teeth of gears and gear-cutters. One of the grinding machines described is for the grinding of poppet valve faces.

Several well-known lathes are now being built with a cabinet leg inclosing an individual motor drive. Three turret lathes incorporating many improvements have been developed. Two of these are large-capacity machines. A heavy-duty automatic has been brought out for turning and facing wheels, flanges and shafts.

A new line of milling machines has been designed for railroad shop or heavy-duty service. Three automatic milling machines for different classes of work are also listed among the new developments. One special automatic machine is being manufactured for milling the oil grooves in locomotive crown brasses. Other standard milling machines are being equipped with attachments to increase their convenience.

Two small crank planers and an open-side crank shaper are included among the planer developments. A massive locomotive-frame slotting machine of the duplex type and having an individual 20-hp., reversing motor for each ram is described in this section. The motors are push-button controlled.

One newly organized concern building punch presses is represented in this issue of the review by a line of inclinable open-back presses. An open-gap punching machine for structural beams and claimed to be the largest of its type ever built is also described. For use in connection with large multiple punches one company has added to its line a spacing machine to feed and gage plates, beams and columns for punching.

The threading machine section includes five tapping machines and four die-threading machines as well as a chasing machine. Among these is a large automatic pipe-threading machine, designed to pick up pipe lengths up to 22 ft., to automatically thread one end and to discharge them. Two smaller, double-end machines have also been developed.

Listed under other machine tools are two sawing machines, one hobbing machine, five broaching machines, and four unclassified. One of the two metal-cutting saws is of the band type. The development of five new broaching machines indicates unusual activity on the part of manufacturers of this class of equipment. Under "Miscellaneous" is included a pipe-flange facing machine designed for handling offset large-diameter pipe. It is a combination of two adjustable units, one of which can be rotated on a circular base. A 90-in. quartering machine and a journal-turning lathe of the same capacity have been developed for service on locomotive driving wheels.

A forging machine and a semi-hot automatic-feed bolt-heading machine are included in the group of "Other Machines." Two interesting lines of equipment have also been brought out for the multiple finishing of automotive cylinders.

The activity of manufacturers of testing equipment is indicated especially by the large number of machines designed for the testing of materials.

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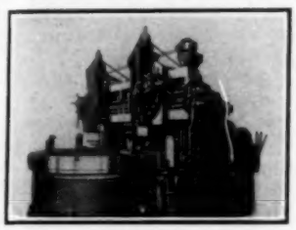
Boring Machines

— 1 —

Tire Mill, Improved, "Betts"

Betts Works of the Consolidated Machine Tool Corporation of America, Rochester, N. Y. [Vol.64,p.220.]

The illustration shows a 96-in. vertical tire mill. Models similar in design have been built also in sizes of 66, 72, 84 and 108 in. No vertical adjustment of the cross-rail is provided on this model, but machines of similar design



can be built with an adjustable cross-rail for shops requiring more room under the tools. The saddles have rapid power traverse. The tool spindles are driven by independent electric motors and are carried in swivels. The spindles as well as the saddles are of steel and are lubricated by alemite.

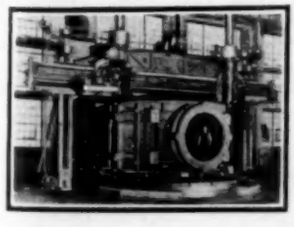
The table is equipped with a four-jaw universal chuck that automatically centers the tires. Continuous feed is provided for the machine, in eight changes operated through sliding gears. The gears are fully inclosed and run in oil. Feed and rapid traverse may be engaged, disengaged and reversed by means of two levers located just above each feed box.

— 2 —

Boring Mill, Vertical, 32-Foot, "Betts"

Betts Works of the Consolidated Machine Tool Corporation of America, Rochester, N. Y. [Vol.64,p.296.]

The 32-ft. boring mill is shown machining a 197,900-lb. turbine casting. The bed, table and upright are of massive construction to resist the strains of heavy cuts on



large work. A deep cross-rail extends back between the uprights to provide adequate stiffness. Clamping to the uprights is accomplished by means of air-operated gibs on the inside and the outside of each upright flange. A 25-hp. motor is used for raising and lowering the cross-rail and for driving the rapid power traverse to the saddles and the tool spindles.

The toolspindles have screw feed with both hand and power movements. They can be swiveled, if desired, for angular work. Independent operator's platforms are provided on each saddle.

The mill is driven by means of a 75-hp., variable-speed motor with mechanical speed changes. The machine has a table 24 ft. in diam. with a swing of 32 ft. and 3 in. The height under the toolholders is 12½ ft. The toolspindles have a travel of 10 ft. Ample lubrication is provided.

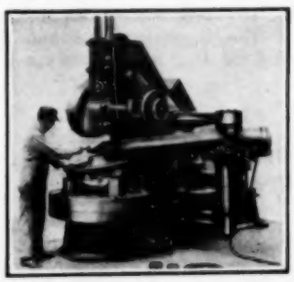
— 3 —

Boring Machine, Car Wheel, 48-Inch, "Niles"

Niles-Bement-Pond Co., 111 *Broadway, N. Y.* [Vol.64,p.849.]

The 48-in. car wheel boring machine has an automatic chuck and a quick-acting crane.

The automatic chuck is built into the table. It is



self-centering, and closes automatically when the table begins to revolve. When the operator reverses the table drive the jaws are automatically loosened.

The crane for lifting the wheels on and off the table is on the right-hand side of the machine. The machine is furnished with either a pneumatic, or a motor driven drum-type of crane. The pneumatic crane can be controlled from the front of the machine. The drum-type crane is driven by a separate 5-hp. motor.

The machine feeds are positive. A single four-position lever at the right hand of the operator gives the changes from roughing to finishing feeds. The boring bar has a counterweight running on rollers on an inclined way on the back of the frame.

If desired, the boring bar can be equipped with a power traverse. A hub-facing attachment can also be furnished. The hub-facing bar feeds outward from the center, and can be operated at the same time that the boring bar is feeding downward.

On belt driven machines, or machines fitted with a.c. motors, the table can be furnished with a pedal-controlled brake. On machines driven by d.c. motors the table is stopped by dynamic braking by pressing a button.

— 4 —

Boring Machine, Cylinder, Model F

Storm Manufacturing Co., Inc., Minneapolis, Minn. [Vol. 54,p.964.]

The model F cylinder-boring machine is designed especially for Ford and Fordson cylinders. The machine has a heavy cast-iron base upon which the cylinder is located.

The boring bar is held in two adjustable bearings, and is of hardened steel.

The cylinders are machined and bored at one setting. The feed is automatic and a stop switch is provided which stops the motor when the cutter-head reaches the end of the cylinder. The cutter-head is adjustable for all sizes of the cylinders. The cutters have two edges, one for roughing, and one for finishing.

The cylinder-boring machine is driven by a ¼-hp. 110-volt motor, furnished with either direct or alternating current. The machine occupies a floor space of 20x32 in. and weighs 325 pounds.

Drilling Machines

— 5 —

Drilling Machine, No. 0, "Junior"

Winterhoff Tool & Machine Co., Elkhart Ave. and Jackson St., Elkhart, Ind. [Vol. 64,p.180.]

The No. 0 "Junior" drilling machine is driven by a ¼-hp. motor rotating at 1,750 r.p.m. It operates the machine through a 1¼-in. endless belt. The motor is mounted

on a hinged support so that the belt tension can be adjusted. A belt guard is provided on the machine.

The spindle is mounted in ball thrust bearings, and means are provided for taking up end and side play. The travel of the spindle is 2¼ in. The distance from the spindle to the table is 7½ in. The machine has a table 8x9 in. in size. The height of the drill is 25½ in. and its weight is 85 pounds.

— 6 —

Drilling Machine, Ball Bearing, Sensitive

Francis Reed Co., 41-43 *Hammond St., Worcester, Mass.* [Vol.64,p.182.]

The 16-in. sensitive drilling machine, illustrated, is equipped with ball bearings throughout. It is driven by an individual motor through an endless belt, whose tension is maintained automatically.

The standard machine has four speeds, ranging from 700 to 3,600 r.p.m. Driving motors for use on 60-cycle, two-phase a.c. current of 110,

220, 440 or 550 volts are standard equipment. The power delivered is sufficient to operate a ⅝-in. drill.

Multiple-spindle models have 10 in. from center to center. The quills are of steel and have a vertical travel of 6 in. They carry a ¾-in. spindle bored for a No. 2 Morse taper. The rack is cut into the steel quill and it has a minimum width of ⅞ inches.

—7—

Drilling Machine, Disk-Drive

Gibbs General Machine Co., 930 West Broadway, Louisville, Ky. [Vol.64,p.338.]

The drill press illustrated is being manufactured to provide a tool having no belts or gears. The principle of transmission is the V-disk. The angularity of the grooves and the disks is 18 degrees.

The entire spindle head and the table can be raised

or lowered. The spindle cone is fitted with double-row, deep-groove, ball bearings. Means are provided for the lubrication of the motor, spindle and cone bearings.

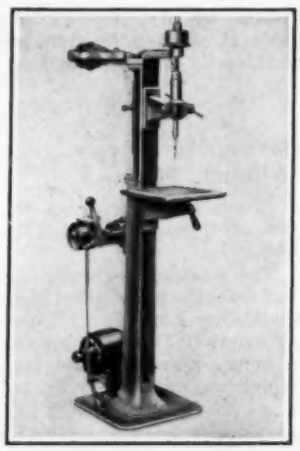
Eighteen speeds, nine in low series and nine in high series are provided. The range of speeds is from 125 to 5,250 r.p.m. The capacity of the drill is ¾ in. and in brass it is 1 in. The table movement can be 25 in. and the maximum distance from the chuck to the table is 39 in. "SKF" ball bearings are used throughout the machine. The motor used as standard is a General Electric ¼-hp., single-phase. A V-block and table center are furnished with each machine.

—8—

Drilling Machine, Sensitive, "Economy"

W. Robertson Machine & Foundry Co., 56 Rano St., *Buffalo, N. Y.* [Vol.64,p.769.]

A sensitive 14-in. drilling machine has been brought out by this company for drilling holes up to ½-in. in diam. Fea-



tures claimed for the machine include the ball thrust bearing in the spindle, and a stud bearing mounting of the spindle pulley. The feed-rack is cut in the sleeve. Both the spindle head and the table are adjustable, and are clamped with a turn of a hand nut. The belt is shifted either by foot or by hand. The machine is furnished with belt or motor drive.

The net weight of the drill is 325 lb., and the floor space occupied is 18x35 in. The height of the machine is 6½ feet.

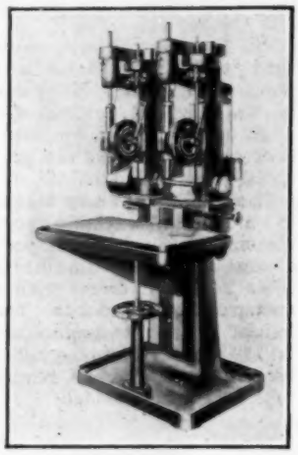
—9—

Drilling Machines, Ball Bearing, Adjustable-Head

Taylor & Fenn Co., Hartford, Conn. [Vol.64,p.220.]

The ball bearing drilling machine, illustrated, is designed for production work with single-pulley drive. Any size pulley can be used in order to give spindle speeds of from 575 to 2,300 r.p.m. The illustration shows the No. 32 two-spindle machine, but machines can be had with from one to six spindles. The heads of the machines are adjustable on the columns. The maximum distance between the spindles of the No. 32 machine is 16 in. The diameter of the spindle nose is 1⅜ inches. It is bored for a No. 2 Morse taper. The table surface of the model illustrated is 16x32 inches.

Variable-speed power as well as hand feed can be provided for the machines. The maximum feed of 0.006 in. and the minimum feed of



0.003 in. per revolution of the spindle are regulated by the diameter of the pulleys on the spindle and on the rear shaft. A slight pressure of the drill against the work is said to be sufficient to engage the power feed. Motors of 1,150 r.p.m. and of from 1 to 3 hp. are required according to the number of spindles. The net weight of the No. 32 drill is 1,180 lb. The weights of the power-feed head and of the tapping head are 75 and 20 lb., respectively.

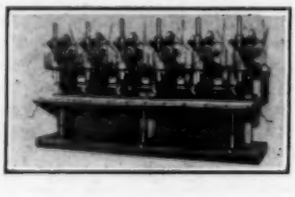
—10—

Drilling Machine, Gang, Production, 20-Inch

W. F. & John Barnes Co., Rockford, Ill. [Vol.64,p.455.]

The 6-spindle, 20-in. gang drilling machine illustrated is intended for production drilling, reaming, tapping, boring, counterboring, spot facing or other combinations of operations. Each spindle is equipped with a Johnson friction clutch and is driven through a Morse silent chain.

Eight feed changes are provided with the machine,



and special pickoff gears can be furnished to give 24 feeds ranging from 0.010 to 0.231 in. per revolution of the spindle.

The main drive is contained in the column of the machine, and consists of heat-treated alloy steel gears mounted on multiple-splined shafts that run in bronze bearings. The column forms an oil-tight compartment so that the driving mechanism can be well lubricated. The spindle is driven through a pair of gears from the main gear train, the spindle-driving gears being located directly above the main head.

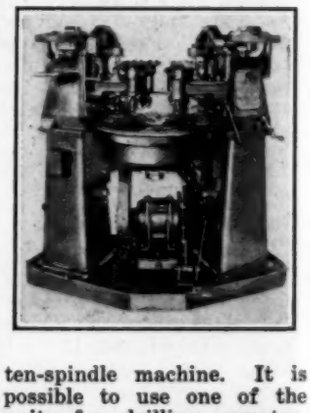
A heavy spiral spring is employed to counterbalance the spindle, and it can be set to automatically return the spindle to the starting point after the feed has been disengaged. A coolant reservoir is located in the base of the column. The machine has sufficient capacity to drive a 1½-in. high speed drill in steel.

—11—

Drilling and Tapping Machine, Ten-Spindle

Anderson Die Machine Co., Bridgeport, Conn. [Vol.64,p. 456.]

The ten-spindle machine illustrated is for drilling and tapping ten holes in one piece at one passing through the machine. Two single-dial, multiple-spindle tapping units have been combined on a single base to make up the



ten-spindle machine. It is possible to use one of the units for drilling, countersinking or counterboring holes and the other for the tapping operations.

The two units are positively timed with the indexing of a dial. The dial used on the machine is similar in its method of operation to the dial-feeding arrangements commonly used on small punch presses. The spindles are adjustable so that any combination of ten

holes can be had. Each dial has adjustable openings to suit the arrangement of the spindles. Ball bearings are used on the high-speed shaft.

The machine is designed to run at a speed of 1,200 strokes per hour so that in this time it will handle 12,000 holes. The machine can be used to advantage in tapping nuts and small pieces containing a number of holes.

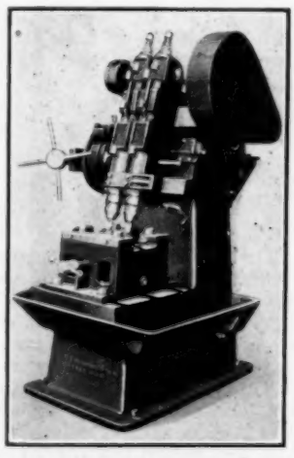
—12—

Drilling Machine, Rail, Inclined

Joseph T. Ryerson & Son, Inc., Chicago, Ill. [Vol.64,p. 696.]

The purpose of the inclined rail drill is to eliminate the handling and turning of heavy rails for the drilling operation in railroad reclamation shops. The rails can be left in the skidding position for drilling.

The drill has either two or three spindles which incline at an angle of 15 degrees, and are controlled by a single



capstan wheel. The motor is carried on a bracket at the rear of the frame. The coolant pump and tank are inclosed in the frame. An adjustable feed knockout is provided for disengaging the feed when the operation is completed. Spindle speeds are changed by changing the gears on the horizontal drive shaft. The drive shaft is connected to the motor by a silent chain, and widefaced herringbone gears are used between the drive shaft and the spindle.

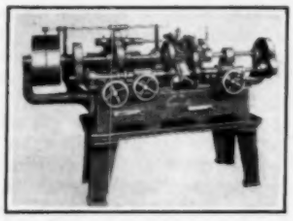
—13—

Drilling Machine, Piston

Hoefer Manufacturing Co., Freeport, Ill. [Vol.64,p.767.]

The horizontal drilling machine shown in the accompanying illustration is for drilling piston pin holes. It is the first of a line of tools for this purpose and is intended chiefly for replacement and for jobbing use.

A four-position trunnion fixture carries the pistons. In the front position of the fixture the pistons are located, and in the second position the holes are rough



drilled from each side, the drills being supported in guide bushings. In position 3, the hole is bored to size straight through from one side with two single-point tools. The two tools are spaced so that one finishes before the second begins, in order to insure the correction of any error in the drilling. The boring bar is rigidly piloted. In position 4, the hole is reamed straight through from one side. The reamer has a long pilot ahead of it.

The throwing in of the power feed levers is done by hand after the operator has brought the various tools up to the work. The drills and the boring and reaming tools all have automatic stops. As soon as the operation is completed the tools stop until the operator returns them to their original position. The fixture is then trunnioned to its next position and a finished piston replaced with a new one.

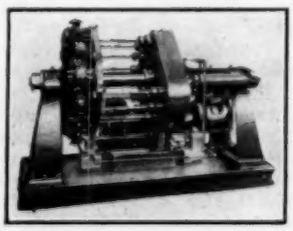
—14—

Drilling Machine, Piston, Production

Hoefer Manufacturing Co., Freeport, Ill. [Vol.64,p.805.]

The production piston drilling machine shown in the accompanying illustration is being marketed for drilling the holes for piston pins in cast iron or alloy pistons.

The machine consists essentially of the base, the trunnion, the roller bearing head and the hydraulic unit.



On the right-hand and left-hand side of the base are mounted two standards supporting the main shaft which is 5 in. in diam. The indexing trunnion, on which are located the sixteen work-holding fixtures, is mounted on the left side of the shaft.

Next is mounted the self-contained main head. The head is motor driven and has roller bearings on its spindles. The tools are provided with a universal-joint drive. By means of a pump, a constant spray of oil is distributed all through the inside of the head. The feed on the machine is furnished through a hydraulic pump driven by means of an individual motor. The hydraulic piston rods are fastened directly to the main head. The oil acts as a cushion to prevent damage to the machine in case any solid object accidentally interferes with the feed of the head.

The indexing trunnion is divided into four quarters, each having four work-holding fixtures. The trunnion has attached to it four cams. The cycle of operation is: first, rapid approach; second, cutting speed; third, rapid reverse; and fourth, stop. The speed of the feed and the duration of each movement can be adjusted.

The main head consists of three spindle groups of four tools each. The first group of tools consists of four boring bars. The second consists of four sizing reamers and the last has four finishing reamers.

—15—

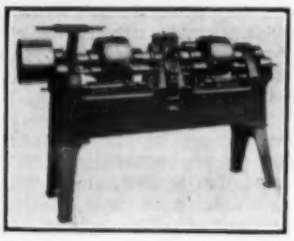
Drilling Machine, Piston, Automatic

Hoefer Manufacturing Co., Freeport, Ill. [Vol.64,p.844.]

The automatic piston drilling machine illustrated, is one of a line of machines intended for drilling the piston-pin holes in cast iron or alloy pistons

The pistons are carried on a four-position trunnion fixture. In the first position the fixture is loaded. In the next position the holes are rough-drilled from each side In the third position the hole is finish bored straight through with a piloted bar that can carry one or two cutters as desired. In the fourth position the hole is reamed straight through by means of a piloted reamer.

The trunnion can be indexed either manually or automatically, as desired. The feeding of the machine is controlled by means of



cams whose cycle is started by tripping a lever. When the cycle is completed, the tools return to their starting position and the feed stops.

—16—

Drilling Machine, Multiple, High-Speed, Center-Feed, No. 2A

Baush Machine Tool Co., Springfield, Mass. [Vol.64, p.886.]

The No. 2A high-speed multiple drilling machine is furnished with round or rectangular drilling heads. The round heads can be had 16, 20 or 24 in. in diam. for twelve or sixteen spindles in each of the sizes. The rectangular heads can be had in sizes of 16x30 or 20x40 in., for twenty-six or thirty-two spindles in each size. The feed ram is directly over the center of the head.

The machine can be arranged for either belt or motor drive. The belt drive is

from a line shaft to tight and loose pulleys mounted on the horizontal drive shaft on the bed of the machine. The motor is mounted on the bed and directly coupled to the drive shaft. The power is then transmitted from the horizontal to a vertical shaft through bevel gears. This shaft drives the spindle through a three-speed gear box. The head is equipped with back gears. The head is balanced by means of a counterweight which is adjustable. The bed of the machine has a continuous oil

groove around it, with a coolant tank under the column. Most of the bearings throughout the machine are ball or roller bearing.

The machine can be arranged for tapping, counterboring or spot facing. The capacity is for eight 1-in. drills in cast iron, or the equivalent. The height with the ram up is 11 ft. and 9 in. The machine requires a 15-hp. motor operating at 1,200 r.p.m. The floor space occupied is 7½ ft. in length, and 4 ft. and 10 in. in width. The weight of the machine is about 9,000 pounds.

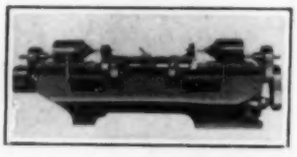
—17—

Drilling, Boring and Reaming Machine, Double-End, Special

Hoefer Manufacturing Co., Inc., Freeport, Ill. [Vol.64, p.1001.]

The machine illustrated has been built for boring and reaming the roller bearing seats in a rear axle of an automobile and simultaneously drilling two sets of holes for attaching the brake units.

On the ways of the machine are mounted two horizontal heads, each containing two spindles with two form cutters for the roughing and finishing operations, respectively. A cluster of eight drills surrounds the roughing tool in each head so that, while the rough boring operation is in process, two groups of eight holes are being drilled in each of the rear axles. Power is transmitted to the main shaft



from the motor by means of a set of sprockets and a silent chain. Power from the main shaft is transmitted to each individual head through a set of spur gears. Spindle speed changes are obtained through gear ratios within the heads. The spindles are mounted on ball bearings. The head units run in a bath of oil.

The feed is obtained through a set of cams mounted on a shaft running the full length of the machine. These cams are arranged for rapid approach, cutting speed, rapid reverse and dwell. At the end of each cycle the feed is automatically disengaged. After the roughing operation has been performed, the work-holding fixture is moved to a second position for the finishing of the roller bearing seats.

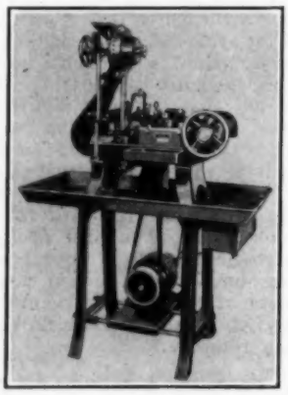
In the base of the bed is a large tank for the storage of coolant, which is fed to the cutting tools by means of a geared pump.

—18—

Drilling Machine, Rivet, Automatic

Waterbury Farrel Foundry & Machine, Co., Waterbury, Conn. [Vol.64,p.540.]

This automatic rivet drilling machine is intended to produce hollow rivets from standard blanks made on a solid-die header. The blanks feed automatically from a drum hopper into the drilling position, where they are gripped by a die while the drill is at work. As a drilled rivet leaves the gripping die it is passed through a device that is called the inspector that inserts a steel pin in the drilled hole. If the hole



is not to standard depth the inspecting device immediately disengages the clutch and the machine is stopped.

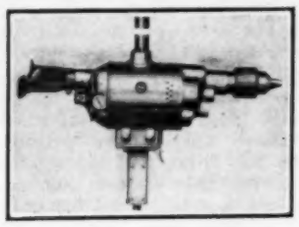
The machine drills standard rivets up to ⅞ in. in diam. by ⅞ in. long and special rivets up to 1 in. long. The depth of hole ranges from ⅛ to ½ in. Speed changes are provided to adapt the drill for different materials. The machine occupies a floor space of 25½x44 in., and weighs 600 lb. net. It is driven by a ½-hp. electric motor or may take its drive by belt from an overhead shaft.

—19—

Drills, Portable, ½-Inch

United States Electrical Tool Co., Cincinnati, Ohio. [Vol.64,p.181.]

Two ½-in. portable electric drills have been brought out by this company. The heavy-duty model illustrated, is of heavy construction to stand



up under severe requirements, while a special model is provided for general, all-purpose work. Both tools have a spade handle that can be removed so that the drill can be secured to the adjusting screw of an "old man."

The motors are designed to operate the drills at 450 r.p.m., full-load speed. Three SKF radial ball bearings are provided, together with a ball thrust washer placed behind the drill check.

The motors are controlled through a trigger switch, which has an "on" and "off" indicator. The motors operate on d.c. or a.c. current of 60 cycles or less.

—20—

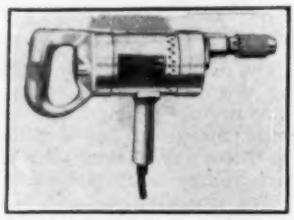
Drills, Electric

Goodell-Pratt Co., Greenfield, Mass. [Vol.64,p.844.]

This company has taken over the line of electric drills formerly made by the A. F. Way Co., under the name of the "Arnold" drill, and has modified and improved them.

The bearings for the armature shafts are of the sleeve type, lined with No. 1 Dutch Boy babbitt. The bearings for the drill spindle are of Bunting bronze. All bearings are provided with a wick oiling device. A ball thrust bearing is provided on the drill spindle.

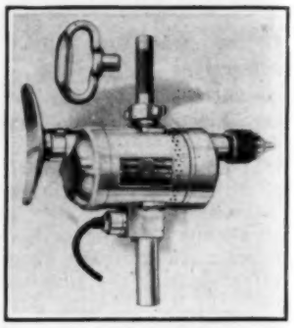
The motors can be operated on alternating or direct current. Speed reduction is secured through hardened



gears greased with a special paste lubricant. A fan is built integral with the motor armature.

The drills are made in several sizes and types, having capacities of ¼, ⅜, ½ and ⅝ in., both light and heavy duty. The smaller tools are made with a pistol grip and provided with a special trigger switch that does not have to be held down by the operator while the tool is in service. The releasing button is located where it will be under the operators thumb.

Fig. 1 shows the ⅜-in. standard drill. The drill spindle in this type is offset. Fig. 2 shows the ⅝-in. heavy-duty drill, fitted with two handles, in one of which is the starting switch. The loop handle of the drill is detachable, and a breast plate may be substituted for it.



The sleeve through which the cable passes has a reverse tapered hole fitted with serrated jaws to clamp the cable.

Bench stands, with screw feed and limiting stops, are provided for the larger sizes of drills.

—21—

Drill, Electric

Millers Falls Co., Millers Falls, Mass. [Vol.64,p.879.]

The electric drill illustrated is for holes up to ¼ in. in diameter.

The body of the tool is of aluminum. The motor runs on either direct or alternating current, the latter of any frequency up to 60 cycles. The motors are furnished for 110- or 220-volt circuits. The armatures shaft turns on ball bearings and the drill spindle is fitted with a ball thrust bearing. Grease lubrication is provided for all bearings and for the heat-treated, alloy steel gears.

A pistol grip handle and a trigger switch that is held down by the trigger of the operator while the tool is in service are provided. The drill has pig-tail brushes which can be removed for inspection or renewal with-

out disturbing any electrical connections. The drill spindle is offset so that holes may be drilled to within $\frac{1}{16}$ in. of a parallel obstruction.

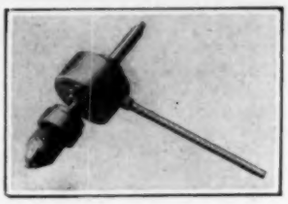
Eight feet of rubber covered cord and an armored attachment plug are furnished with each tool. The total weight of the tool is 5 lb. and the length is 12 in. overall.

— 22 —

Tapping Attachment, Improved

Bicknell-Thomas Co., Greenfield, Mass. [Vol.64,p.695.]

The shell of the improved tapping attachment is made in one piece. The central driving gear which turns the tap is made with two substantial driving lugs, milled integral with the gear.



The driving dog is splined to the shank and is further strengthened by a pin that passes through the dog and shank. The spindle and all of the gears are made from nickel steel.

The attachment is made in three sizes: No. 1 takes taps up to $\frac{3}{8}$ in., No. 2 is for taps from $\frac{3}{8}$ to $\frac{3}{4}$ in. and the No. 3 is for large taps up to $1\frac{1}{4}$ in. in diam. All sizes are fitted with plain or friction drive chucks as desired.

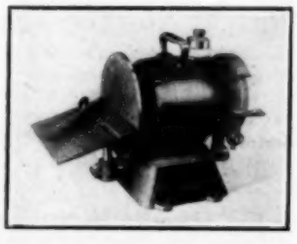
Grinding Machines

— 23 —

Grinding Machine, Disk and Tool, No. 2

Winterhoff Tool and Machine Co., Elkhart Ave. and Jackson St., Elkhart, Ind. [Vol.64,p.219.]

The No. 2 grinder illustrated, carries one disk wheel and one tool-grinding wheel. The grinding wheels are mounted directly on the motor



shaft. The tool grinding wheel is 6x$\frac{1}{2}$ in., for a $\frac{1}{2}$ inch arbor. The metal disk wheel is 8 in. in diam. The tilting table is grooved for a protractor guide. A $\frac{1}{3}$-hp., a.c. motor with its switch built in is used for power. Six feet of cord are supplied.

— 24 —

Grinding Machine, Face, Improved

Diamond Machine Co., 9 Codding St., Providence, R. I. [Vol.64,p.295.]

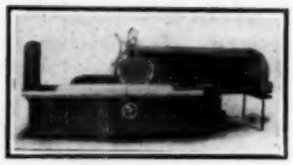
The improved Diamond face-grinding machines are built in sizes to accommodate grinding wheels 30, 36, 54 and 66 in. in diam., and with tables in various lengths up to 18 feet.

The 30- and 36-in. machines are driven by 40-hp. motors of the 40-deg. type at speeds of either 900 or 1,200 r.p.m. The drive is through a Morse silent chain and sprockets. The chain is of $\frac{3}{4}$ pitch and is 7 in. wide.

A special sectional wheel chuck is furnished to accommodate twelve abrasive blocks for the 30-in. machine and fifteen blocks for the 36-in. machine. The segments are adjustable for wheel wear for over 6 in. of their depth before renewal.

The table has been redesigned to provide for quicker drainage and to make cleaning easier. The flat table ways have been made wider and the V-ways are deeper. The total width of the table is 24 in. and the length is 134 in. for the two sizes above mentioned.

The capacity of the machines allows for a maximum height of grinding room of



20 in. for the 30-in. machine and 27 in. for the 36-in. machine. With the front guard plate removed, the maximum height is 24 and 30 in., respectively. The maximum length that may be ground on either of the two machines is 84 inches.

The total floor space occupied by either machine is 8 ft. and 4 in. front to back, and 25 ft. and 2 in. from end to end. The net weight, without the motor, is 14,000 lb. for the 30-in. machine and 15,500 lb. for the 36-in. machine. The motor weighs 2,000 pounds.

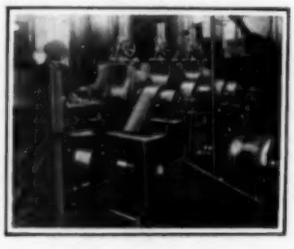
— 25 —

Grinding Machine, Hexagon, Triplex, No. 78

Gardner Machine Co., 410 East Gardner St., Beloit, Wis. [Vol.64,p.333.]

The No. 78 triplex grinding machine illustrated is intended primarily for grinding hexagonal spark-plug shells, but it is also adapted to other parts of a similar nature, such as hexagon nuts.

Three pairs of grinding members are set immediately behind each other on a single base. An endless chain having studs to fit the bore of the parts to be ground brings the work between the grinding wheels. The spark-plug shells are placed on these studs by hand, and they are automatically aligned for the first grinding operation. After they pass through the first pair of wheels they are



automatically indexed one-third of a revolution to present the next two faces to the following pairs of wheels.

The chain carrying the shells is driven from a jackshaft in the machine base through a wormgear reducer in order to secure the proper rate of feed. It is controlled conveniently through a friction clutch by means of a hand lever. Two operators can be used to advantage to load the chain which, it is claimed, will accommodate 7,000 shells per hour.

— 26 —

Grinding Machine, Disk, Vertical, Special Adaptation

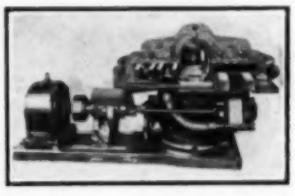
Charles H. Besly & Co., 118-124 North Clinton St., Chicago, Ill. [Vol.64,p.335.]

The No. 29 motor-driven vertical spindle grinder has been equipped with a special fixture for grinding one side of conduit boxes.

The fixture which can be seen in the illustration consists of two yokes attached to the outer guard ring support. To these yokes are attached eight adjustable, steel, channel irons which form four work slots or guides across the top of the disk wheel. At the top of each work slot an adjustable spring pressure bar is mounted.

The power-driven feeding device is mounted at each side of the machine directly in front of the guide channels. Each unit is driven individually by belt direct from the machine drive shaft. Friction cut-out clutches are provided as a means of safety.

The disk-truing devices is mounted directly in the center



between the two pairs of work-feeding guides. The device consists of a 1x4-in. machine steel bar secured to brackets at each end. A sliding saddle is mounted on this bar. On one side of the saddle is secured an adjustable vertical slide. The wheel truing cutters are mounted on a cutter spindle on the lower end of the slide. A pull-and-push rod is attached to the saddle for drawing the dresser back and forth across the face of the grinding disk. The grinding machine used for the work carries a wheel 53 in. in diam. and $1\frac{1}{4}$ in. thick.

A 15-hp. a.c., or d.c., motor can be connected to the drive shaft through a flexible coupling. The exhauster pulley is mounted on the hub of the coupling.

— 27 —

Grinding Machine, Disk, Double-Spindle, Oilgear-Feed, Heavy Duty, No. 28

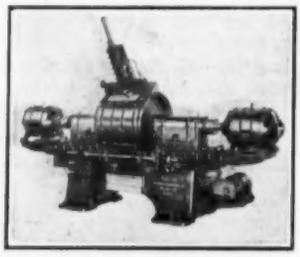
Gardner Machine Co., 410 East Gardner St., Beloit, Wis. [Vol.64,p.536.]

The No. 28 Oilgear-feed disk grinder, having a double spindle, is similar in its construction to the smaller model No. 27 previously described on page 483, Vol. 60, of the *American Machinist*.

It has a more rigid construction than the previous machine. Improved Timken adjustable bearings are used for the spindles of the machine, which are 3 in. in diam. at the bearings and 4 in. in diam. between them.

The sliding heads are operated by means of the standard-type Oilgear feed and a pressure of 9,000 lb. can be obtained between the heads, if desired. Independent adjustment screws have been provided for each head.

The grinding members consist either of 26-in. steel disk wheels mounted on rigid, reinforcing backing-plates or of ring wheels 24 in. in diam. and 6 in. deep, having any desired center opening. The hood inclosing the grinding



members is of cast steel and is suitable for either wet or dry grinding. The dressing device on the No. 28 machine is also operated by Oilgear.

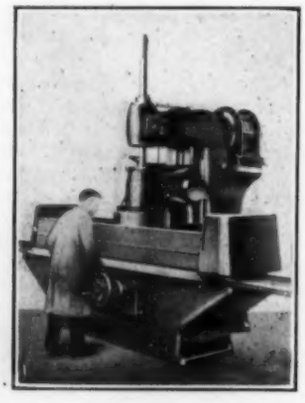
The front and the rear of the machine carry finished pads to permit the use of power-operated, cross-feed knees without altering the base casting. Both legs are hollow to serve as coolant reservoirs when the machine is used for wet grinding. A 30-hp. motor is used for driving the grinder, which occupies a floor space of 14x10 ft. and weighs approximately 8,000 pounds.

— 28 —

Grinding Machines, Surface, Vertical, Model B, Improved

Pratt & Whitney Division of Niles-Bement-Pond Co., Hartford, Conn. [Vol.64,p. 375.]

The model B vertical surface grinding machines manufactured by this company have been improved, and a direct-geared motor drive for



the machines has been provided. The improved grinders are being built in 14- and 22-in. sizes, the 22-in. machines being furnished with either a 4- or 7-ft. bed.

The motor is mounted on a bracket cast in the rear at the top of the column. The motor drives the grinding wheel spindle through circular bevel gears in a right-angle drive. The spindle rotates on ball bearings.

The columns of the machines have been made heavier and more rigid, so as to provide a suitable support for the motor. The wheel-head and the spindle mountings have also been made heavier. A 25-hp., 1,750-r.p.m. motor is used for the 14-in. machine, and a 40-hp., 1,150-r.p.m. motor is used to drive the 22-in. model. Motors can be furnished for either a.c. or d.c. current. The gears used in the transmission are made from heat-treated alloy steel.

The floor space occupied by the short 22-in. model is 19 ft. and 2 in. by 8 ft. and 10 in., including the motor. The floor space occupied by the 7-ft. model is 28 ft. and 9 in. by 8 ft. and 10 in. The height of each machine is 10 ft. and 7 in., and their weights are 16,500 and 19,250 lb. net, respectively.

The floor space occupied by the 14-in. machine is 6½ ft. oy 13 ft. and 2 in., including the table travel, and the height is 9 ft. and 5 in. The weight of the machine without the motor is 8,990 pounds.

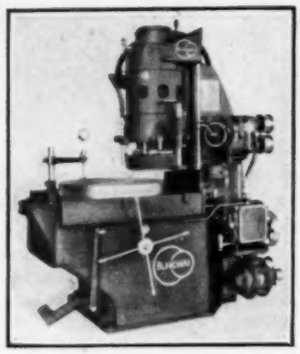
— 29 —

Grinding Machine, Surface, Vertical, No. 16

Blanchard Machine Co., 64 State St., Cambridge, Mass. [Vol.64,p.923.]

On the No. 16 vertical surface grinder of the direct motor-drive type improvements have been made in the mounting of the spindle.

A single Gurney radio-thrust bearing is used at the upper position. The outer race is held in a cartridge against which springs act in an upward direction. The thrust supplied in this manner is sufficient to overcome the rotor weight and in addition to impose a thrust load on the lower bearing so as to eliminate initial looseness and to prevent further axial lead yield when the grinding load is imposed. A dam arrangement about the shaft forms a reservoir for oil beneath the bearing, and a rotating flinger acts as a centrifugal pump to elevate the oil to the bearing.



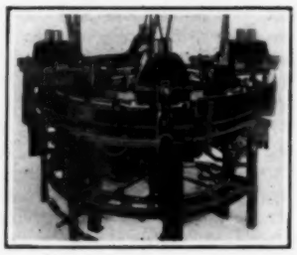
A Gurney radio-thrust bearing is also used in the lower bearing location and is lubricated in a similar manner. The bearings are completely inclosed in order to prevent the entrance of dirt and water. The cooling water passage has been simplified so that it can be easily cleaned. The wheel guard has also been changed. It is fastened directly to the head.

— 30 —

Grinding Machine, Surface, Continuous

Joseph Ross & Co., Irvington, N. J. [Vol.64,p.964.]

The machine illustrated has been designed to secure continuous operation in grinding. A series of magnetic chucks arranged in a circle carries the work under



the grinding heads, of which there are as many as the work demands.

The chucks are independent and the current to each can be thrown off when the loading point is reached. The annular table is driven by an internal gear through the pinion from a motor in the center.

The heads can be belt driven as shown, or they can be driven by means of individual motors. The wheels can be of any width or grade to suit the work requirements. The rotary grinding bed rests on rollers. The machine shown is 75 in. in. diam., and the table is 12 in. wide. The weight is 2,500 pounds.

Work not requiring a high finish can be fed at two or four points in order to increase the output.

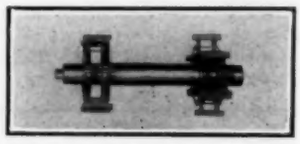
— 31 —

Grinders, Large-Bore

Hutto Engineering Co., 515 Lycaste Ave., Detroit, Mich. [Vol.64,p.75.]

The grinder illustrated is of a double-end or tandem type. The tool consists of a central driving member with a set of six stones at each end. The over-all length of the tool is less than half the length of the bore, so that there will be no overlapping of the stone travel of the two ends.

Each stone is 6 in. in length and is set in die-cast metal holders arranged radially and equidistant from



each other. The holders each have two pins faced and resting against two opposed adjustable cones. They are held in close contact with the cones by means of two endless coiled springs passing over the two grooved ends of bars which, in turn, pass through each pair of stone-holder pins.

The stones can be dressed with the edge of a file or dressing stick in order to remove the glaze. Kerosene is used as a coolant. For operating the tools grinding machines are manufactured by the company to order.

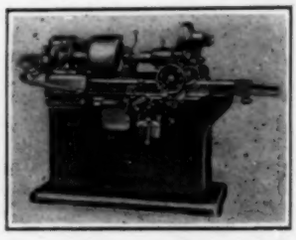
— 32 —

Grinding Machine, Internal, "Size-Matic"

Heald Machine Co., Worcester, Mass. [Vol.64,p.377.]

The "Size-Matic" internal grinding machine is for the continuous, automatic grinding of parallel or tapered, plain or splined holes. When the machine has been set, no plugs or gages are necessary.

The wheel grinds the work, continuing to reciprocate until the hole is ground nearly to size. The wheel then withdraws and is automatically dressed by the diamond. It next returns to the work and moves through it at a



greatly reduced rate of traverse. When the hole is ground to size it withdraws and the cycle is complete.

The machine is essentially similar to the automatic internal grinding machine previously described on page 410, Vol. 63, of the *American Machinist*. The automatic sizing is accomplished by a cam mechanism. Compensation is also made for the reduction in wheel size after dressing, automatically.

The floor space occupied is 49½x60 in., and the weight of the machine is approximately 5,000 pounds.

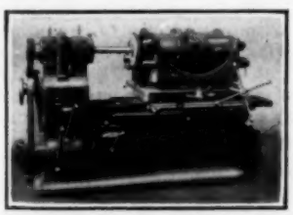
—33—

Grinding Machine, Cylinder, No. 50, Adapted

The Heald Machine Co., Worcester, Mass. [Vol.64,p. 845.]

The grinding machine illustrated is especially adapted to grind the cylinders of steam-driven compound air pumps. It is a modification of the regular No. 50 Heald cylinder-grinding machine. The machine has an extended bed and a rotating fixture in which the four assembled cylinders can be secured in position to bring the original centerlines of the pump cylinders into alignment with the table traverse of the grinding machine so that all four cylinders can be ground at one setting.

While the job is still on the floor, aligning bars are put through the bores of the respective pairs of cylinders and locating disks are placed upon the bars. There are four of these disks tapered upon the peripheries to match the beveled counterbores at each end of the pump cylinders.



The casting is then lifted by and deposited on the fixture. A device at each end of the cross-bar has hardened and ground steel plates on its upper surface. The level of the plates relative to the centerline of the grinding machine is such that when taken in conjunction with the radius of the bars resting upon them, the centerlines of the latter will coincide with that of the grinding machine in a horizontal plane.

Four large spring plungers assist in carrying the load on the fixture. The centerlines are next brought into parallelism with the vertical plane by means of hand-operated cams. These cams wedge the bars apart equidistantly from the centers of the studs. When the cylinders are located the spring plungers are locked to carry the load and the locating bars removed to permit grinding.

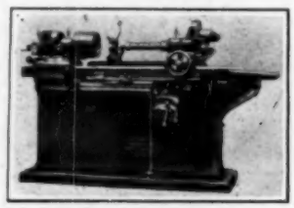
The positions of the cross-slide necessary to bring the separate centerlines of the cylinders coincident with the centerline of the grinding machine are governed by adjustable stops. The floor space occupied by this machine is 60x120 in. and the weight is 9,000 lb. net.

—34—

Grinding Machine, Internal, No. 72, Special

Heald Machine Co., Worcester, Mass. [Vol.64,p.924.]

The No. 72 Internal Grinding machine is being equipped with a special long bed to



adapt it to grind holes in work-pieces up to 22 in. in length.

A special workhead with a hollow spindle can be substituted for the regular workhead. The hole through the spindle may be of any desired diameter up to 6 in. and when so fitted the position of the work-piece can be reversed.

The machine can be furnished for either belt or direct motor drive. The extra length available is 18 in. The floor space occupied is 118x50 in. and the weight is 5,000 lb., net.

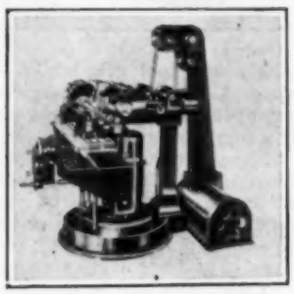
—35—

Grinding Machine, Universal, 10x35-Inch, Improved

Thompson Grinder Co., Springfield, Ohio. [Vol.64,p. 418.]

The 10x35-in. improved universal grinding machine manufactured by this company is being equipped with a self-contained motor drive. The cage containing the motor is bolted to the rear of the base and the belt drive is carried up through a hollow box column. A 3-hp. motor is used to drive the grinding wheel, and a ½-hp. motor is direct connected to drive the healstock. The headstock provides for five work-speed changes and swivels through a complete circle. The grinding table carrying the work is made adjustable to any desired position relative to the grinding wheel.

The base is cast integral



with the reservoir which has a settling basin open on top to permit easy access for the removal of settlings. The inner column is of box design, and it is rigidly attached to the base on the bottom and to the grinding wheel head on top. It carries the lower bearing for the power feed shaft. The rear column is also of box design and is similarly attached to the base and to the grinding wheel head. The outer column has an annular bearing on the base to which it is clamped in any desired location to suit the work. On this outer column is gibbed the knee which supports the carriage and table. When this column is to be rotated a slight movement of a lever will bring into action a roller bearing to facilitate its movement. The knee can be adjusted when desired.

The pump is of the centrifugal type, the bearings being above the coolant level, but the runner is immersed at all times, obviating the necessity of priming.

For cylindrical grinding, the machine will accommodate work 10 in. in diam. and 36 in. long between the centers. For surface grinding, it will accommodate work 8x48 in. The grinder can be adjusted for a taper of 3 in. per ft. The hand vertical adjustment of the knee is 10 in. The main grinding spindle rotates at 1,920 r.p.m. and the motor shaft at 420 r.p.m. The floor space required is 10x10 ft. and the height of the machine is 6 ft. and 4 in. Its weight is about 3,800 pounds.

—36—

Grinding Machine, Centerless, No. 5-C

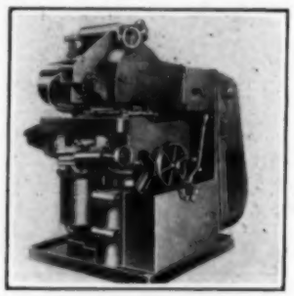
The Detroit Machine Tool Co., 6545 St. Antoine St., Detroit, Mich. [Vol.64,p.922.]

The No. 5-C centerless grinding machine, illustrated, is for full or semi-automatic shoulder or straight through grinding.

The machine has a camshaft to control the various movements in the grinding operation and to repeat contantly a cycle of operation. The cam can be adjusted to take any depth of cut ranging between 0.005 and 0.020 inches.

The work is fed to the machine by means of an automatically controlled magazine. The grinding wheel moves down to the work, oscillating endwise at the completion of the stroke, and returns to the loading position. While the grinding wheel is in the loading position the piece that has been ground falls from beneath the wheel and out through a chute, while the next piece falls into position.

The machine will handle shoulder work ranging in lengths up to 8-in. under the head. It will also handle straight work ranging in diameter from ⅛ in. to 4½ in. and lengths up to 16 ft. The



machine is arranged to accommodate any width of wheel up to 8 in. The work driving wheel is made from a hard composition designed to furnish friction with no abrasive action.

An 80-gallon tank that is cast integral with the base of the machine holds the grinding solution. A centrifugal pump and means for straining the coolant are provided. The machine is entirely electrically driven. A variable speed a.c. motor, the power for which is obtained from a generator on the machine, drives the feed wheel. If a 230-volt d.c. current is available the generator can be eliminated. The driving wheel spindle is driven by means of a 15-hp. motor.

— 37 —

Grinding Machines, Hob, Automatic, "Schuchardt & Schutte"

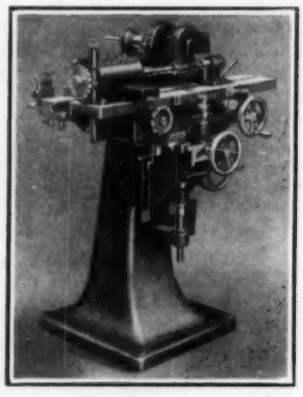
George Scherr, 142 Liberty St., New York, N. Y. [Vol. 64,p.180.]

Two sizes of automatic hob grinders have been placed on the market. The hob grinders, one of which is illustrated, are designed to reduce the time consumed in starting and stopping the machines while indexing.

The travel of the table and the indexing of the hob are automatic. The tooth of the hob is fed toward the grinding wheel by hand from time to time. Radial grinding of the cutting edges can be performed.

The knee is moved vertically by means of a handwheel, and another is used to adjust the cross-slide. The movement of the table can be either automatic or by hand. The length of table travel can be adjusted.

An improved spiral indexing head is used. The indexing is done by means of dividing plates which have a number of circles. The feeding



of the cutter toward the grinding wheel is done by means of a handwheel. The spindle runs in ball bearings.

The machines are equipped with a dust exhaust that deposits the dust in a water tank. They can be equipped for either belt or motor drive and will accommodate hobs up to 6¼ and 9¾ in., respectively.

— 38 —

Grinding Machine, Cutter and Tool, Universal, Motor Driven, No. 1, "Grand Rapids"

Gallmeyer & Livingston Co., 346 Straight Ave., S.W., Grand Rapids, Mich. [Vol.64, p.338.]

The No. 1 "Grand Rapids"

cutter and tool grinder, illustrated, has been redesigned to provide for a self-contained motor drive.

The grinding wheels are driven from a ¾-hp. motor mounted in the base of the machine. A snap switch is provided on the side of the base. The base carries also a column on which is mounted the grinding head and its two wheels. The column is hollow and the belt for driving the wheels passes through it to the motor.

A 1/12-hp. lamp-socket motor is built into the headstock to provide for handling internal and cylindrical work. For internal grinding, the table can be swung on the column and clamped at right angles to the grinding head.

The machine will swing work between the centers 9½ in. in diam. and 20 in. long. The longitudinal movement of traverse is 15 in. and the transverse movement is 7 in. The table can be raised over a distance of 6¾ in. on the column. The capacity for face-milling cutters is 12-in. in diam. The weight of the machine is 585 pounds.

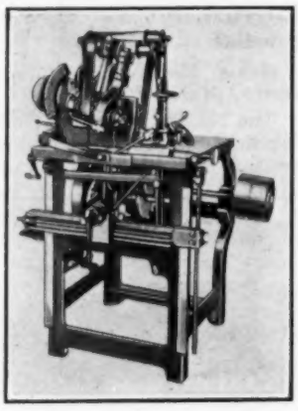
— 39 —

Sharpener, Saw, Band and Circular Automatic, No. 1

Hooker Manufacturing Corporation, St. Johnsbury, Vt. [Vol.64,p.457.]

The No. 1 automatic ball bearing band and circular-saw sharpener illustrated has been placed on the market. The illustration shows a belt-driven model, but the machine is also equipped with individual motor drive. It will accommodate saws of various gages, diameters, and ranges, but cannot be used for sharpening novelty saws, or saws with specially shaped teeth. The grinding wheel oscillates to give any desired bevel to cut-off saws, while a cam action control is used on the machine to produce various shapes of teeth. The same cam can also be used for sharpening cut-off and rip saws. An adjustment is provided to accommodate all tooth spacings within the range of the machine.

The machine is lubricated by means of the Alemite system. The arbor is mounted on dustproof ball bearings, and is driven direct by means of a large belt running from the countershaft of the machine over self-adjusting idlers with spring control. The grinding wheel furnished with the machine as standard is 8 in. in diam. and has an arbor hole ¾ in. in diam. The tight and loose pulleys are 7½ in. in diam. and have a face 2½ in. wide. They rotate at 300 r.p.m. A ½-hp. motor is used for the direct drive. The machine is equipped with dust guards,



and with gear guards on the motor-driven model. The height of the machine is 54 in., and the floor space required is 36 x 37 in. The weight of the belt-driven model is 725 lb., and that of the motor-driven machine is 750 pounds.

— 40 —

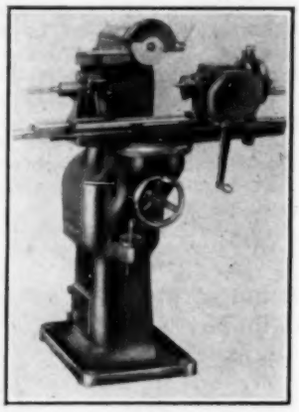
Grinding Machine, Hob and Cutter

Pratt & Whitney Co., Division of Niles-Bement-Pond Co., Hartford, Conn. [Vol.64, p.534.]

The improved motor-driven grinder illustrated was designed especially for grinding the "Curvex" cutters manufactured by this company, but it can be used as well for sharpening gear hobs, thread hobs, form milling cutters and for general purpose work.

The motor for operating the machine is mounted inside the column on a hinged platform. The pulley on the wheel spindle is belt-connected to the motor. For the ordinary sizes of cutters, a ¾-hp. motor with a belt 1¼ in. wide is used. A 1-hp. motor and a belt 2 in. wide can be used for heavy duty.

The wheel spindle is mounted on ball bearings, and means are provided for taking up the end thrust.



The wheel is trued at an angle to clear itself when grinding in spiral-fluted cutters. The column is a single casting on the front of which is carried the knee mounted on a dovetailed slide. This slide is at an angle of 12 deg. from the vertical position in order to correspond to the cone angle of the wheel.

The table is arranged to pivot on top of the knee. The table is traversed longitudinally by means of a hand lever operated through a rack and pinion movement. Stops are provided for controlling the movement of the table. The index head is driven from the same pinion which meshes with the table rack. A system of change gears provides for leads varying from 3 to 133⅓ in. The head spindle can be rotated through a small arc sufficient to pick up a flute with the grinding wheel.

The machine is designed primarily for dry grinding, but it can be arranged for wet grinding. The machine occupies a floor space of 58 x 40 in. and weighs approximately 1,200 lb. net.

— 41 —

Sharpener, Circular Saw, Automatic

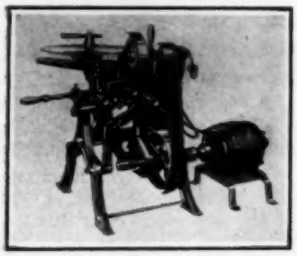
Samuel C. Rogers & Co., 10-16 Lock St., Buffalo, N. Y. [Vol.64,p.580.]

An improved motor-driven circular-saw sharpener has been placed on the market. The machines are built in three sizes to cover a range of saws of from 6 to 72 in. in diameter.

The machine is fully automatic for saws with four teeth or more to the inch and

with flat-faced teeth. Saws having bevel-faced teeth can be accommodated by the machine and sharpened semi-automatically.

The No. 1 machine is a bench-type unit equipped with a ½-hp., single-phase motor to be operated from an ordinary lighting circuit. It will accommodate saws of from 6 to 40 in. in diam. The Nos. 2 and 3 machines are equipped with ½-hp., 3-phase, 60-cycle motors.



The No. 2 machine will accommodate saws of from 8 to 48 in. in diam., and the No. 3 machine will handle saws 8 to 72 in. in diam. Both of the latter models are floor machines. Three saw gumming wheels and rubber belting are supplied with each of the machines. Three saw gumming wheels and rubber belting are supplied with each of machines.

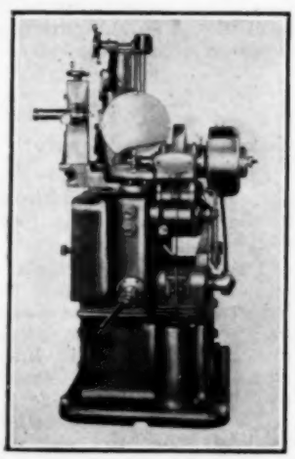
—42—

Grinding Machine, Gear and Cutter-Tooth, "National-Cleveland"

National Tool Co., Cleveland, Ohio. [Vol.64,p.613.]

The gear and cutter-tooth grinding machine shown in the illustration is for grinding gears and gear shaper cutters by the Simmons method.

The generating of the involute curve is accomplished either by "molding generation" or "describing generation." In the first, the curve is generated from the pitch circle and in the second it is generated from the base circle. The machine is driven by means of two ¾-hp. motors located in its base. One motor drives the wheel spindle and the other motor operates the remaining movements of the machine.



The machine will grind gears up to 10 in. in diam. and with a 1-in. face, by means of a plane-surfaced grinding wheel 12 in. in. diam. With a wheel 18 in. in. diameter the machine will grind gears with a 1½-in. face. It is intended for dry grinding. A 3-in. suction pipe is provided for removing the dust.

Dust-proof oil cups are provided on the machine at points where lubrication is necessary. Ball bearings are used throughout with the exception of the grinding-wheel spindle and the work-carrying spindle proper.

The grinding machine stands 5 ft. and 10 in. high and occupies a floor space of about 3x2 ft. Its weight is approximately 2,600 pounds.

—43—

Grinding Machine, Tool, "Keypower"

Keystone Grinder and Manufacturing Co., Pittsburgh, Pa. [Vol.64,p.615.]

A portable electric grinder equipped with a special tool-holding fixture has been

placed on the market under the trade name "Keypower." It is designed to grind twist drills, but can be adapted for general grinding purposes.

The work is ground on the face of the wheel, which is 7-in. in diam. and has a 1½-in. face. A wedge-shaped fixture holds the tools rigidly and in proper relation to the wheel so that the results are uniform. Regular equipment handles drills from ¼ to 1½ in. in diam., but an attachment for larger size drills can be furnished. Air instead of water is used as the cooling medium.

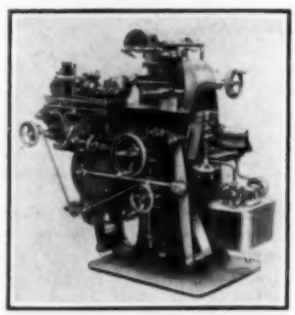
The ½-hp. Westinghouse motor is fully inclosed and ventilated, and is bolted to the base. An outboard bearing relieves the motor bearings of undue strain. A toggle switch is mounted on the base. A hood guards the grinding wheel. The machine is portable and weighs 60 lb. The dimensions are 17x12x10½ inches.

—44—

Grinding Machines, Cutter and Reamer, Universal, Automatic, "Sickle"

L. Sichel, 6 Cliff St., New York, N. Y. [Vol.64,p.616.]

For the automatic rough and finished grinding of face, end, side and special milling cutters as well as gear cutters, taps and reamers, and



for sharpening similar tools, two "Sickle" universal cutter and reamer grinders have been placed on the market.

Separate 1-hp. motors are used to drive the wheelhead and the table movements. The wheelhead has a compound adjustment so that it can be moved radially as well as for any angularity desired in helix grinding. The wheelspindle is compensating.

An attachment is supplied with the machine for use in automatically sharpening the side teeth on both sides of cutters. This attachment is automatically indexed from the head. Its spindle can be swung 90 deg. in the vertical plane and 30 deg. either side.

The Type 1 machine which is not adapted to taper grinding will take cutters between the spindles up to 10 in. in length. The maximum table travel is about 6 in. while the maximum length that can be ground is 4 in. The maximum diameter that can be ground is 5¾ in. An 0.8 hp. motor is required. The net weight of the machine is about 1,200 pounds.

The Type 2 machine will accommodate cutters on its centers, 16 in. in length. The maximum grinding length is 10 in., while the table travel is 12 in. The maximum diameter it will handle is 8 in. on centers and 10 in. on the swivel head. Cutters with up to 42 flutes can be ground. Helix angles up to 27 and 45 deg. are obtainable for cutters 4 and 8 in. in diam. respectively. The wheelhead can be swiveled 180 deg. The floor space required is 46x40 in. and the net weight of the machine is 2,400 pounds.

—45—

Sharpening Machine, Hob, Full-Automatic, Model FSS-A, "Pfauter"

O. Zernickow Co., 15 Park Row, New York, N. Y. [Vol. 64,p.693.]

The design of the model FSS-A "Pfauter" full-automatic hob-sharpening machines based on the model FSS hob-sharpening machine previously described on page 1074, Vol. 63, of the *American Machinist*.

The machine is driven by belt, or by an individual motor. From its single pulley the drive is transmitted to the grinding wheel spindle, and to the table drive.

The reversing of the table is controlled by stops. The maximum table travel is 17¾ in. The indexing of the hob, according to the number of flutes, is accomplished by means of change gears. The lead of the spiral is obtained by means of an independent change gear system.

The machine is designed for handling spiral-fluted

tools up to 10¾ in. in diam., and 13¾ in. in length, depending on the nature of the tool and the diameter of the grinding wheel. The machine can be used for grinding work that has straight flutes. Face mills up to 13¾ in. in diam. can be sharpened.

The grinding spindle is hardened and ground, and it runs in an adjustable dust-proof bearing of phosphor-bronze. A 3-hp., 1,500-r.p.m., motor is recommended to drive the machine countershaft, which rotates at about

800 r.p.m. The table can be swiveled 45 deg. in each direction. It can be adjusted 8¾ in. vertically. The size of the table is 48 x 9¾ in. The maximum diameter of the grinding wheel is 8 in. The floor space occupied by the machine is 67 x 71 in., and the net weight is 2,310 pounds.

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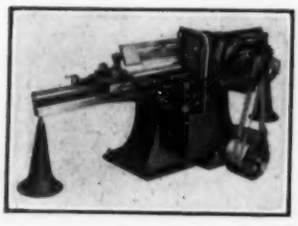
Grinder, Knife, Motor-Driven, Type B, "Rogers-Buffalo"

Samuel C. Rogers & Co., 10-16 *Lock St., Buffalo, N. Y.* [Vol.64,p.887.]

A heavy-duty, motor-driven, type B grinder has been placed on the market for grinding shear blades. It is made in ten sizes for handling knives up to from 54 to 130 in. in length, and 1½ in. thick. Motors of 3 hp., 25 or 60 cycle, and 2 or 3 phase can be supplied.

The machine has an automatic feed for the knife and a center support. A spring



cross-feed is provided, as well as an automatic stop. At the back of the machine is mounted a coolant tank with a belt-driven pump. The grinding wheel is carried at the front of the motor and mounted on its shaft. It is a 12-in. cup emery wheel. The tight and loose pulleys have a 3½-in. face and operate at 800 rev. per minute.

Similar to the full-automatic machine is the type C semi-automatic grinder. The latter has small handwheels at either end of the knife bar for feeding the knife up to the grinding wheel.

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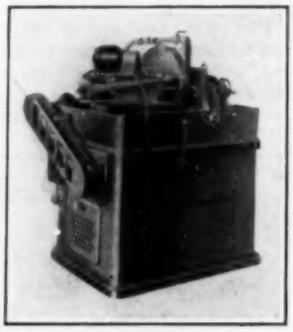
Grinding Machine, Valve

Fitchburg Grinding Machine Co., Fitchburg, Mass. [Vol.64,p.651.]

The grinding machine illustrated is especially designed to grind the face of poppet valves of the type used in automotive engines. The machine can be belt or motor driven. The abrasive wheel is 18 x ¾ in. Its spindle runs in adjustable tapered-sleeve bronze bearings. The spindle bearings are 5⅝ in. in length by 2¼ and 2⅛ in. in diam., respectively. They are mounted in a slide that has a limited range of movement in a direction at right angles to the axis of the spindle. This movement is brought about by means of a cam that is located in the gear box.

The workhead is driven by a small independent motor of ¼ hp., mounted directly on the head. The angular position of the head is adjustable and may be locked at angles of 30, 45 and 60 deg. The valve to be ground is held by its stem in a spring collet that is actuated by a long



horizontal lever. The workhead has a continuous reciprocating movement in a direction parallel to the axis of the main wheelspindle, regardless of the angular setting of the head. The range of this movement is adjustable.

The position of the diamond truing device is fixed with relation to the work so that advancing the wheel by means of the hand adjustment does not alter the size of the work being ground. The truing may be effected at any point of the cycle and without stopping the cycle movement. Change gears permit a rate of cycle movement from 4 to 8 per minute.

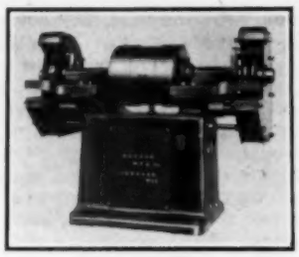
The machine is provided with a geared pump to circulate the grinding compound or cooling liquid, and the deep pan which forms the top of the cabinet base serves to guard against undue splashing. The floor space occupied by the machine is 45x45 in., and the net weight without the motor is 3,400 pounds.

— 48 —

Grinder, Motor-Driven

Ransom Manufacturing Co., Oshkosh, Wis. [Vol.64,p.260.]

The direct motor-driven grinder, illustrated, was designed primarily for use in the automobile industry, but it can be used equally well as a production grinder in other industries.



The machine will accommodate 20x2-in. wheels on each end. Each end of the grinder is equipped with a heavy work support and guards. The shafts run in long sleeve bearings made from lumen metal. A Westinghouse, d.c., variable-speed motor is used for power. The speed of the motor can be raised 75 per cent above normal to compensate for the reduced peripheral speed of worn grinding wheels. An automatic accelerating starter actuated by a push-button control is provided. The weight of the machine is 2,000 pounds.

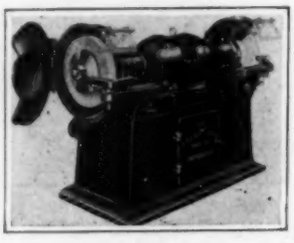
— 49 —

Grinder, Heavy-Duty

The United States Electrical Tool Co., Cincinnati, Ohio. [Vol.64,p.541.]

The heavy-duty ball bearing grinder illustrated is built in six sizes ranging in capacities from an 18x3-in. wheel to a 30x5-in. wheel. It can be equipped for alternating or direct current.

The motor is an integral part of the machine; the motor rotor is mounted directly upon the grinder spindle which is of nickel steel, and one piece. The spindle is



carried on four heavy-duty ball bearings, two at each end, which are mounted in dust-proof boxes.

The a.c. grinders have a remote control located in the base of the machine. The push-button station is on the motor frame. The d.c. motors are equipped with a manually operated starter and fused switch, but remote control can be furnished for the motors, if desired.

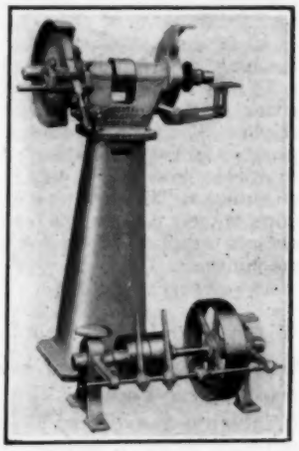
The motor ratings are based on 40 deg. C. rise and 100 per cent momentary overload. The 18x3-in. a.c. grinder is driven by a 5-hp. motor, at 1,120 r.p.m., no-load speed. The spindle is 66-in. long over all and is 2-in. in diam. between the flanges. The floor-to-center height is 33-in., the base is 26x53-in., and the net weight is 1,705 lb. The 30x5-in. grinder is driven by a 15-hp. motor at 680-r.p.m. no-load speed. The spindle is 70-in. long and is 3-in. in diam. between the flanges. The net weight is 3,300 pounds.

— 50 —

Grinder, Tool, No. 12, "Economy"

W. Robertson Machine & Foundry Co., 56-58 *Rano St., Buffalo, N. Y.* [Vol.64,p.847.]

The heavy-duty "Economy" tool grinder, No. 12, shown in the accompanying illustration, has a special high-carbon steel spindle running in



self-oiling bearings. The bearings are of the sleeve type, 4¾-in. long, made of special metal. A felt wick fitted through a slot on the bottom of the bearing carries the oil over the full length.

The grinding rest is adjustable, and a special rest is also built for the grinding of chisels and other beveled tools. The machine carries two wheels in sizes up to 12 x2x1-in. A countershaft is supplied with the grinder.

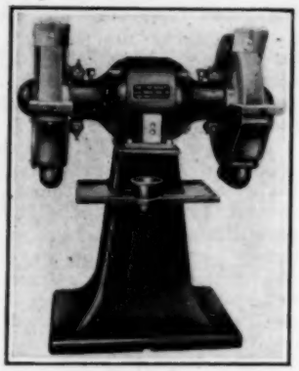
— 51 —

Grinders, Heavy-Duty

Cincinnati Electrical Tool Co., Madison and Edwards Roads, Cincinnati, Ohio. [Vol. 64,p.926.]

Two heavy-duty grinders, one of which is shown in the illustration, have been placed on the market. The grinders are driven by fully-enclosed 2- and 3-hp. electric motors, respectively.

The spindle rotates on ball bearings that are mounted



in dust-proof housings. The wheel flanges and nuts are machined so as to be in balance with the spindle to reduce vibration.

Wheel guards of the exhaust type and adjustable to allow for wheel wear are provided. Removable covers bolted to the guard completely inclose the side of the wheels, flanges and nuts for safety.

The 2-hp. grinder is equipped to carry 12x2x1¼-in. wheels and the 3-hp. grinder carries 14x2½x1¼-in. wheels. Motors can be had for alternating current of 220 or 440 volts, 25 to 60 cycles, 2 or 3 phase, or for direct current of 115 or 230 volts.

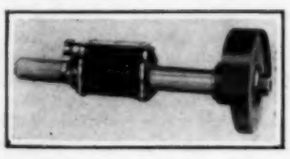
— 52 —

Grinders and Drills, Pneumatic "Roto"

Warner & Swasey Co., Cleveland, Ohio [Vol.64,p. 768.]

Additional sizes and models of its "Roto" pneumatic tools have been placed on the market by this company. The air motor used for the tools is of the two-cylinder type. The cylinders are placed end to end, and through them runs a single shaft carrying two eccentric cylindrical rotors that are keyed in opposing positions. A large ball bearing mounted between the two cylinders centralizes the rotor assembly.

The type D-1 grinder, illustrated, is intended for general-purpose work in light grinding, buffing and polishing. The tool is designed to operate at any desired speed up to 4,000 r.p.m. A 6x1x⅝-in. grinding wheel is used. The weight of the



type D-1 grinder is 8¾ pounds. This type of grinder can also be provided with a shaft extension on the wheel end, especially for grinding otherwise inaccessible surfaces. When the air pressure is only from 50 to 65 lb., the tool can be supplied with 2-to-1 reduction gears to increase its power. A right-angle head can be fitted to the motor to make the tool convenient for grinding large surfaces with abrasive disks. The weight with a right-angle head and an 8-in. disk is 13 pounds.

The type D-3 grinder is a larger size for heavy-duty work. It will carry wheels up to 2 in. wide. The load speed of this type is 3,200 r.p.m., and its free speed is 4,000 r.p.m. Its over-all length is 17½ in., and its weight without the wheel is 16 pounds.

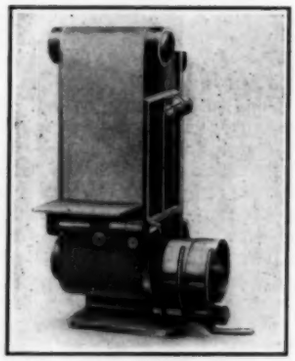
The E-3 pneumatic drill is reversible. It is capable of drilling and tapping ½-in. holes through cast iron 1½ in. thick. Three models are furnished, having speeds of 500, 750 and 1,500 r.p.m. The weight of the drill is 13 pounds.

— 53 —

Grinders, Abrasive-Belt, Ball-Bearing

Coats Machine Tool Co., Inc., 108 West 40th Street, New York, N. Y. [Vol.64,p. 379.]

The ball bearing, convertible abrasive-belt grinder illustrated is shown bolted to an upright stand from which



it can be removed and used as a horizontal bench-type unit. The table can be replaced with a guide bar.

The drums are 3½ and 5 in. in diam., respectively, and are turned cylindrically instead of with a crown so that radius grinding can be done.

The machines are built in two sizes, Nos. 1 and 2. The grinding tables of the machines have surfaces 6½x14 in. and 6½x22 in., respectively. The drums have center distances of 16 and 24 in., respectively. The net weights are 70 and 84 lb. and the upright stands weigh 30 and 50 lb., respectively.

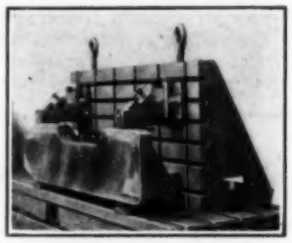
A horizontal machine, not illustrated, has drums 3 and 6 in. in diam. The center distance of the drums is 30 in. The speed of the machine is from 800 to 900 r.p.m., and the weight is about 225 pounds.

— 54 —

Fixture, Grinding-Machine, Work-Holding

Diamond Machine Co., Providence, R. I. [Vol.64,p. 76.]

The grinding machine work-holding fixture, illustrated, is intended to accommodate a wide range of miscellaneous work of various sizes and irregular shapes without the



use of auxiliary clamps, bolts or blocks.

The fixture comprises an angle plate and four clamping members that can be adjusted in T-slots to the desired position. The two lower members are equipped with hardened serrated plates upon which the work is clamped from above. Stop screws are provided for work to be ground on one side only. Adjustable, positive stops are provided for use when grinding the second side of straight work.

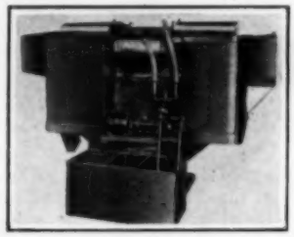
The two upper members have a fulcrumed clamping lever. In each lever is inserted a self-aligning clamping jaw, also hardened and serrated. These clamping members have stop screws and adjustable, positive stops.

— 55 —

Grinding System, Wet, Improved

Badger Tool Co., Beloit, Wis. [Vol.64,p.76.]

The illustration shows a built-in type of motor-driven grinder equipped with this company's improved wet-grinding system. The view is taken from the rear of the No. 4 machine. Cast-iron



water pans attached to the pedestal form a basin into which the coolant falls. It is drained off to the settling tank through cored openings in the pedestal. The reinforced sheet metal guards and shields are shaped so as to completely inclose all the moving or working parts.

A "Fulflo" pump is mounted on the pedestal above the settling tank. It is driven through a flexible coupling from a small electric motor.

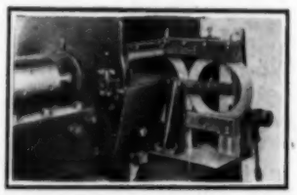
A valve at the pump and one at each wheel are provided for regulating the flow of coolant.

— 56 —

Fixture, Grinding-Machine, Asbestos-Ring

Gardner Machine Co., Beloit, Wis. [Vol.64,p.178.]

The special fixture illustrated is for the facing of asbestos clutch rings and is intended for application to the Gardner disk grinder, No. 14. The fixture consists of steel guide bars fastened to two opposed guiding members. It is rigidly supported at the front and at the rear of the machine. The clutch rings are fed through the fixture by hand since the material



is too flexible to lend itself to automatic feed. Both sides of the ring are ground to proper thickness within an accuracy of 0.005 inches, it is claimed.

The grinding machine carries two grinding heads with steel disk wheels, 20 in. in diam. Both heads are movable and have micrometer adjustments. They are held stationary during grinding operation by spring tension. A dressing device is provided.

The weight of the machine is 4,000 lb. and it requires an operating floor space of approximately 6x8 feet.

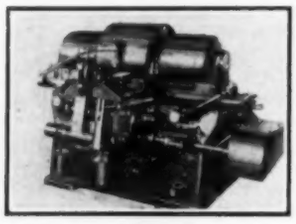
— 57 —

Grinding Fixture for Leaf Spring Eye

Badger Tool Co., Beloit, Wis. [Vol.64,p.219.]

The above company has adapted one of its disk grinding machines for grinding parallel and to size the sides of leaf spring eyes.

The machine is fitted with two built-in, 10-hp. motors for driving the main grinding spindles and a separate 1-hp. motor with a cone pulley for operating the power



fixture mechanism. Abrasive cylinder wheels 18x1½ in., are used as grinding members. The grinding heads are opened by means of cams as the spring enters and are closed down to micrometer stop screws by means of weights. The work holder is caused to travel in between the wheels by means of a weight and lever, and it is brought back into loading position by means of a double cam.

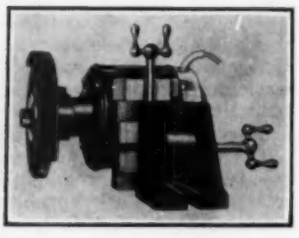
The machine is built in both belt and motor-driven types and is arranged for either wet or dry grinding. The complete unit weighs 4,500 lb. and requires an operating floor space of 8x11 feet.

— 58 —

Grinder, Angle-Plate Double-Slide

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.64,p.498.]

The double-slide, angle-plate grinder illustrated is built around an electric motor designed and manufactured by the company. An angle plate carries the horizontal slide which can be moved by means of a screw over a distance of 4¾ in. The horizontal slide in turn carries a vertical slide on which is mounted the motor. The vertical slide, also operated by means of a screw, has a travel of 5½ inches.



The grinding wheel is 8x¾-in., and it is protected by means of a wheel guard. The machine is equipped with ball and sleeve bearings. Either ½-hp., 60-cycle a.c. motors or d.c. motors can be supplied. The a.c. motors are for 110-volt, single-phase, 220-volt, single-phase, or 220-volt, three-phase current and rotate at 3,400 r.p.m. The weight of the a.c. type is 68 lb. The regular d.c. motors are for 115- or 250-volt service and operate at 3,000 r.p.m.

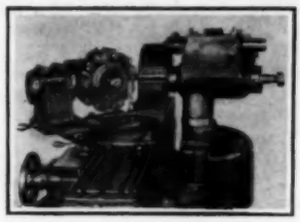
The weight of the d.c. type is 63 pounds.

— 59 —

Attachment, Radius-Grinding

Thompson Grinder Co., Springfield, Ohio. [Vol.64,p.880.]

The attachment illustrated is for radius grinding on the Thompson 10x36-in. universal grinding machine. The purpose of the tool is for sharpening the faces, sides and corner radii of channeling milling cutters such as are used by railroad shops for work on side rods. It can also be used for grinding radii on other cutters, including end mills. The capacity for milling cutters ranges from 3¼ to 10 in. in diameter.



Small end mills can also be ground by removing a bracket and inserting in its place an arbor having a taper hole in its end, into which the shank of the end mill is inserted.

The sliding movements are graduated in thousandths of an inch and the rotary movements in degrees. A gage is furnished to give the required clearance angle. The device is universal and flexible.

Lathes

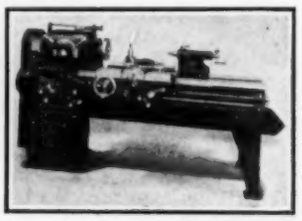
— 60 —

Lathe, Motor-Driven, 15- and 16-Inch

Carroll & Jamieson Machine Tool Co., Batavia, Ohio. [Vol.64,p.77.]

The 15-and 16-in. lathes manufactured by this company are being provided with motor drive. The belt-driven models were previously described and illustrated on page 522, Vol. 63, of the *American Machinist.*

The motor is housed in a cabinet leg or base at the headstock end of the machine.



The drive from the motor to the lathe is through a belt. A 2-hp. 850-r.p.m. motor controlled by a snap switch, is used. In other respects these machines are similar in design and construction to the belt-driven models previously mentioned.

— 61 —

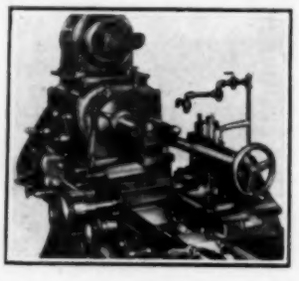
Lathe, Production, Semi-Automatic, Heavy-Duty, Type B

Sebastian Lathe Co., Cincinnati, Ohio. [Vol.64,p.533.]

The type B improved semi-automatic, motor-driven production lathe for heavy-duty service is built in sizes of 15-, 18- and 20-in. swing.

The lathe is driven by means of a 5-hp. motor through a 4-in. double-ply belt. It can be furnished also in the cone-head type. The geared headstock provides speeds of from 19½ to 487 r.p.m. The tailstock has an adjustable side movement for taper turning.

The carriage and the apron are joined by means of a long key. The power cross-feed is of the pull type and engages the gears from the side. A thread-chasing dial is regularly furnished. A safety device prevents the simultaneous engagement of both feeds.



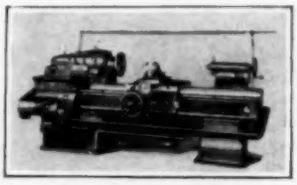
The carriage is fitted with cross-feed and length gages to provide a semi-automatic control by means of which repetition work can be accurately handled. The gages can be taken off the machine and stored until necessary to use them again.

— 62 —

Lathe, Model B, 20-Inch

Pratt & Whitney Co. Division of Niles-Bement-Pond Co., Hartford, Conn. [Vol.64, p.575.]

A 20-in. lathe shown in the accompanying illustration has been added to the line of Model B lathes of this company. The machine is designed for motor drive. A 7½-hp. motor is regularly furnished with push-button control and low-voltage protection. By means of a belt, the drive is carried from the motor to the main drive shaft at the rear of the machine.



The geared head is totally inclosed. Sixteen spindle speeds are provided to give a range of from 8 to 383 r.p.m. The back gear lock acts as a clutch. It is possible to throw in the back gears and operate the lock by merely moving the spindle through a distance corresponding to the width of one tooth. The hole through the spindle is 2 in. in diam. The bore of the spindle nose is for a No. 19 Jarno taper. The range of 36 threads is from 1 to 56 pitch, while the feeds range from 0.0030 to 0.1667 for both the carriage and the cross-feeds. By combining the two feeds a taper of 45 deg. can be cut.

The apron is so arranged that no bevel gears are used. Spur gears and worm drives carry the longitudinal and the cross-feeds to the carriage slide.

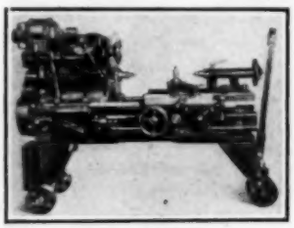
Splash oiling and centralized oiling are used on the machine. The lathe is available with beds having center distances of 48, 72 and 96 in. The net weight of the 48-in. machine, with regular equipment, is about 6,200 pounds.

— 63 —

Lathes, Engine, Portable, 16- and 18-Inch, Series A

Rahn-Larmon Co., Cincinnati, Ohio. [Vol.64,p.656.]

The portable engine lathe shown in the accompanying illustration is manufactured especially for use in the railroad shop. It is provided



with four wheels, two of them on a swivel bearing. Ball bearings are used for each of the wheels.

The motor is mounted above the headstock and geared direct to the all-geared spindle drive. Nine changes of speed are provided for the headstock spindle. The usual feeds are provided on the lathe and a lever disengages the feed screw from the feed gears.

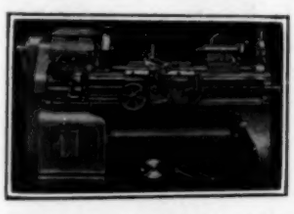
A 1-hp. motor is used to drive the machine. It has push-button control and reverse. Cord is provided for attachment to the regular power system of the shop. The lathe is built in 16 and 18 in. sizes and with beds 5, 6 or 7 ft. long, as desired.

— 64 —

Lathes, Motor-Driven, Type S, Improved

Sebastian Lathe Co., Cincinnati, Ohio. [Vol.64,p.733.]

The type S lathes manufactured by this company and previously described on page 859, Vol. 55, of the *American Machinist*, are being made with a direct-drive from a motor enclosed in a cabinet-type leg. The motor can be removed through the end of



the cabinet leg by removing four screws. The entire leg is a solid casting.

The lathe is built in three sizes for swinging work, 15, 18 and 20 in. in diam. A 3-in., double-belt is used for the 15-in. machine, while a 4-in. double-belt is used for the 18 and 20-in. machines. The smaller lathe is driven by means of a 3-hp. motor, and a 5-hp. motor is used for the larger sizes.

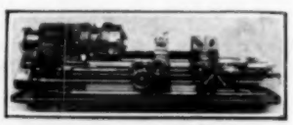
— 65 —

Lathes, Turret, 3L and 4L

Gisholt Machine Co., 1000 *E. Washington Ave., Madison, Wis.* [Vol.64,p.687.]

Two ball-bearing turret lathes are being manufactured by this company. The illustration shows the operating side of the 4L machine, which has a swing of 28-in. The 3L machine has a 21-in. swing. Two types of each size are available, one with a fixed-center turret and the other having a cross-feeding turret. For the 3L machine 15-hp., 1,200 r.p.m. motor is recommended. On the 4L machine the drive is from a 25-hp., 1,200 r.p.m. motor.

The headstock unit consists of a drive shaft carrying a double multi-disk friction clutch and multi-disk brake, an intermediate shaft with



the necessary gearing, and the headstock spindle which carries the two driving gears, one on either side and close up to the front bearing. Eight changes in the speed of the spindle are provided.

Eight reversible feed changes are provided in each apron and additional feeds can be secured by pick-off gears in the headstock end. Feeds from 1/256 to ½ in. per rev. and all standard threads are secured from one set of change gears, and special gears can be provided when required. Four automatic longitudinal trips are provided for the tool post carriage. Six longitudinal trips for the turret carriage are provided, as well as an automatic trip for the cross-feed rod.

The taper attachment will permit tapers up to a maximum of 6 in. per ft. in lengths of 15 in. On the fixed center turret type of machine the taper attachment is connected with the square turret on the side carriage. On the cross feeding turret type the taper attachment is connected with the cross feeding turret unless otherwise specified. The net weight of the 3-L machine is 11,000 lb., while 19,000 lb. is the net weight of the 4-L machine.

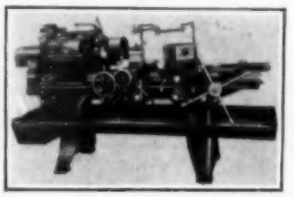
— 66 —

Lathe, Turret, Universal, No. 1-B

Foster Machine Co., Elkhart, Ind. [Vol.64,p.847.]

The improved universal turret lathe No. 1-B, has a split-ring type binder for the hexagon turret, a power traverse unit for the turret slide, a longer bed to permit greater longitudinal feeding movements, and an increase in swing over the ways and cross-slide.

The cross-slide extends entirely across the bed, and has a working travel of 10 in. On the rear of the cross-slide



a pad is provided for mounting tools in back of the work. The cross movement has 12 reversible power feed changes. The longitudinal feeding movement of the carriage is 32 in. The hexagon turret has a turning movement of 30 in., with 12 feed changes independent of those for the cross-slide and carriage.

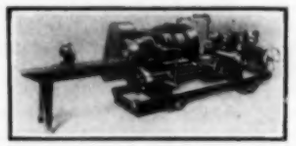
The hole through the spindle is 2⅝ in. The gears in the head run in a bath of oil. Twelve spindle speeds are obtained through gearing. The head is cast integral with the bed, which is of the reinforced double girder type. The automatic chuck is of the master collet type with a capacity of 2 in. The mechanism can be supplied for either draw-in or push-out types of collets. The swing over the bed is 17 in. A threading attachment of the leader and follower type, and an attachment for turning tapers up to 3 in. per ft. are supplied for the machine.

— 67 —

Lathe, Turret, Universal, Heavy-Duty, No. 3-A

Warner & Swasey Co., Cleveland, Ohio. [Vol.64,p.877.]

A heavy-duty universal turret lathe, with a 7½-in. bar capacity, has been brought out to provide increased driving power, sturdy feed trains, and high rigidity. The ways of the machine are protected completely from grit and cutting lubricant by means of way covers.



The machine is universal for either bar or chucking work. The capacity through the chuck is for 7½-in. round bars, with a turning length up to 39 in. The maximum swing over the ways for chucking work is 25¼ in., and the square turret carriage clears a diameter of 18 in The hexagon turret carriage has a longtiudinal movement of 48 in., while the square turret has a cross travel of 12¾ inches.

The hexagon turret has 16 feeds, either forward or reverse. The square turret provides 16 longitudinal and 16 cross feeds for the carriage. These may be operated either forward or reverse. The machine has 16 spindle speeds readily controlled by levers on the head. The gears in the head run in oil, while flood lubricant is provided for the entire head. The front and back shafts and also the drive shaft run on taper roller bearings with adjustment for end play. Oil is fed to the ways of the machine by pressure. A geared oil pump delivers the cutting lubricant at the rate of six gal. per min. When the machine is supplied with motor drive, the motor is mounted on a vertical plate at the rear head-end leg.

The standard bar equipment consists of a 22-in., three-jaw, scroll chuck; a ratchet bar feed with work support, two universal turners, a chamfering tool, a short and a long flanged tool holder, and a 3-in. automatically opening diehead.

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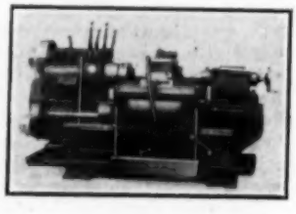
Lathe, Heavy Duty, Automatic, No. 16

R. K. Le Blond Machine Tool Co., Cincinnati, Ohio. [Vol.64,p.493.]

The No. 16 heavy duty automatic lathe illustrated is intended for either turning or facing, or a combination of both, and will do multiple cutting on such parts as



wheel hubs, housings, sleeves, flanges, gear blanks, and shafts.

The headstock provides nine changes of speed from a constant-speed driving pulley that is connected to the shaft by means of a multiple disk clutch. A constant-speed geared motor can be mounted on the headstock for drive to a gear, which replaces the driving pulley. The range of several speeds is obtained by means of sliding gears made from chrome-nickel alloy steel, heat-treated and hardened. The bronze spindle bearings are tapered, babbitt lined, and adjustable.

The tailstock is screw operated and is of the set-over type. It has a long bearing on the shears of the bed and is clamped to this by means of four bolts. The front and rear carriages each contain a cam drum and a system of cams from which the longitudinal movement of the carriages and the cross movement of the base slides are all derived. Change gears provide for variation in the rate of movement of the cam drum. The front and rear carriages, cam mechanism and slides are identical in construction. The lathe can be operated from either the front or the rear since duplicate sets of control levers are provided.

For plain taper turning an attachment can be furnished for either carriage. The maximum taper is 4 in. per foot.

The swing of the lathe over the carriage is 16½ in. and over the facing slide is 12 in. With a 7-ft. bed the machine will take 24 in. work between the centers. The maximum travel of the facing slide is 4½ in. and the maximum turning length is 7 in. The range of nine spindle speeds is 16 to 103 r.p.m. The diameter of the driving pulley is 16 in. and its speed is 400 r.p.m. A 15-hp., 1,200 r.p.m. motor is recommended for individual drive. The weight of the machine is 7,400 lb. net.

— 69 —

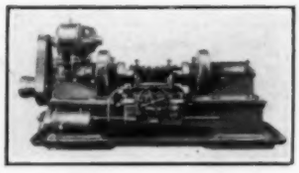
Lathes, Crankshaft, Semi-Automatic, 34-Inch

Wickes Brothers, Saginaw, Mich. [Vol.64,p.531.]

Two semi-automatic crankshaft lathes have been added to the line of this company. The duplex type is illustrated. Both the duplex and the universal type lathe can be furnished with a belt or a motor drive.

The main drive is through a silent chain belt from a 15-hp. motor. The feed is also operated by a heavy chain and the coolant pump has a direct gear drive. The front headstock is provided with a clutch and a brake for driving and stopping the spindles of the front and of the rear headstocks. Two speed changes can be obtained by means of a shift lever. The rear headstock can be moved on the bed.

The faceplates or flanges are forged integral with the spindles. The spindle journals are ground and run in bronze bearings that are



lined. The front and the rear spindles are driven together by means of a heavy steel shaft. The drive is through large herringbone gears.

The front and the rear tools are fed toward the center simultaneously. The cross-feed screw is made in one piece from nickel alloy steel. It is driven by means of a wormwheel on the front. Ball thrust bearings take the pressure in both directions. Double-plate construction is used for the apron. The feed box is equipped with roller bearings. It is of the quick-change type and has eight changes of feed. A 1-hp. motor drives the cross-feed screw. The cutting tools are automatically returned to the idle position.

The pot chucks for the cranks are of the quick-opening type, and they are adjustable for crankshafts of from four to six inches in stroke. They can be extended to clamp the crankshaft next to the pair of pins being machined.

The lubrication of the headstock is from a central point through sight feed to all the bearings. The cross-slides are lubricated by means of Alemite grease cups.

The universal-type lathe is identical with the duplex-type except that it is arranged for machining one pin at a time instead of a pair. The carriage is made narrow so that it can be moved from one extreme to the other without interference.

A power longitudinal feed is provided as well as automatic longitudinal stops and a positive longitudinal bar for locating the carriage in the correct position for filleting the pins.

The machines have a swing over the bed of 34-in. and over the cross-slide of 20¾ in. They will take work 46-in. in length between the faceplates. The width of the carriage bridge for the duplex-type machine is 38-in. and for the universal type it is 25½ in. The floor space required is 4 ft. and 8 in.x13 ft. and 1 in. The net weight is about 14,500 lb. without the motor.

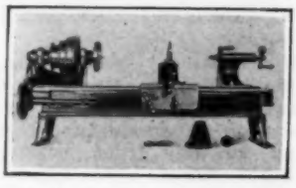
— 70 —

Lathe, Bench, "Gem Junior"

Kiddle's Machine Tool Works, Kinsman, Ohio. [Vol. 64,p.38.]

The "Gem Junior" bench lathe is for screw cutting and general lathe work within its range.

The centers are offset 1¼ in. so that the lathe tool will have a greater cutting capacity. The machine will swing over the bed up to 10¼ in. in diam. and 20 in. in length. Work 8¼ in. in diam. can be swung over the saddle. The



spindle is made from high-carbon steel and has a hole ⅞ in. in diam. through its length. The spindle bearings are 1¼x2¾ in. and are made from white bronze.

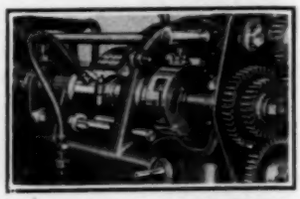
The machine can be provided either with motor drive or with a friction countershaft drive. The size of the lathe is 9x36 inches.

— 71 —

Lead-Screw Control, Automatic

Cleveland Automatic Machine Co., Cleveland, Ohio. [Vol.64,p.182.]

The lead screw mechanism illustrated is intended for application to automatic screw machines and is to be used in combination with change gears when desired for a range of threading work. To the right of the tailstock spindle carrying the diehead is secured a split-nut carrier which engages the lead screw. After the spindle and diehead have advanced to the work through the usual mechanism, a cam closes the



split-nut onto the lead screw. Rotation of the screw will then cause the nut and the spindle to feed the diehead onto the work. When the threading has been completed, the diehead is automatically tripped and the diehead and nut carrier are then returned to the starting point.

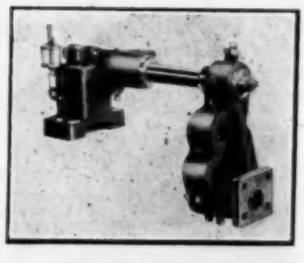
— 72 —

Tools, Turret-Lathe, Universal

Warner & Swasey Co., Cleveland, Ohio. [Vol.64,p. 336.]

The tools shown in the two accompanying illustrations have been designed for use principally in connection with the Nos. 1, 2, 4 and 6 turret-lathes made by this company. The multiple turning head with an overhead pilot attachment permits the use of heavy feeds without necessitating special pilot bars.

The head, which is illustrated, has a radial adjustment to compensate for wear without sacrificing rigidity. The bar is supported in the head by means of four screws to provide a four-point bearing for alignment with a bushing on the head of the machine. The over-head pilot bar passes into a bracket which attaches to the front of the head of the machine. The multiple turning head itself contains holes located



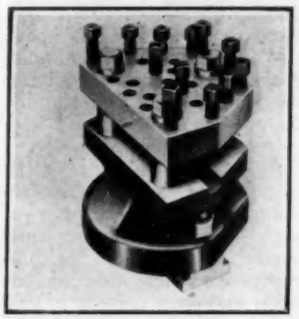
at different distances from the center to provide for an increased range.

An offset cutter holder, not illustrated, is designed for use in the multiple turning head when the cutter would project too far if used in the straight or angular cutter hole. The holder is moved in and out of the head for the length of the cut.

A multiple cutter holder,

not illustrated, is similar in design to the off-set cutter holder. It carries two cutters which are adjustable to different positions for turning two diameters at the same time, or for turning and facing. Tie screws and bushings are furnished to prevent the sides from springing apart when clamping the cutters.

The universal cross-slide cutter block which is illustrated is designed to make unnecessary special cutter



blocks on multiple facing and forming operations. The blocks are available either for the front or the rear. Each block can be swung in four different positions on the cross-slide.

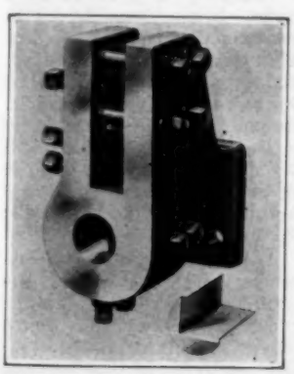
—73—

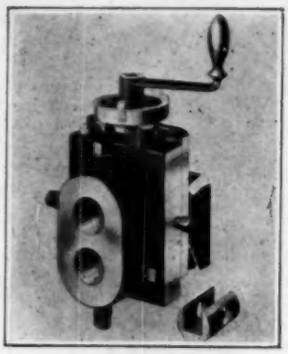
Tools, Universal, for Turret Lathes, Nos. 4 and 6

Warner & Swasey Co., Cleveland, Ohio. [Vol.64,p. 692.]

The line of turret lathe tools previously described on page 336, Vol. 64, of the *American Machinist*, has been supplemented with those shown in the accompanying illustrations, designed especially for use on the Nos. 4 and 6 turret lathes manufactured by the company.

The multiple cutter head is intended for use in turning, facing, chamfering and boring operations at the same time that the cross-slide is also cutting. The head is of





the vertical type so that it will not interfere with the cross-slide.

The vertical slide tool is intended for recessing, back facing, boring, chamfering and similar operations. The slide proper is supplied with a large micrometer dial for convenient and accurate resetting. Clips are provided which can be placed on any of the points at which it is desired to reset the tool. A taper gib compensates for wear and increases the rigidity of the slide assembly. A binder screw is provided for clamping the slide.

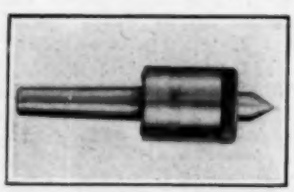
A turret-slide support, not illustrated, has been designed for use when it is necessary to have an extreme overhang of the turret slide and where it is not possible to use any kind of piloting, especially when using the vertical slide tool. The support is to be clamped on the bed of the lathe between the cross-slide and the turret unit.

—74—

Centers, Live

Precision Gauge & Tool Co., 6482 Epworth Blvd., Detroit, Mich. [Vol.64,p.840.]

The "Friction-Less" live center, illustrated, can be adapted to any size or style of lathe by using various removable taper shanks. It is mounted on two roller bearings, the front bearing being



of the tapered radio-thrust type, and the rear bearing the Hyatt spiral-wound straight-roller type, floating free. The tapered roller bearing is adjustable.

Any size taper shank can be furnished and can be attached to the body of the live center by means of cap screws. The Model BB is for use with taper shanks up to No. 4 Morse or No. 12 Jarno. The outside diameter of the body is 2 1/16 in., the overhang 3 1/2 in. and the overhang of the center point beyond the body is 1 1/8 in.

The Model CC is for use with larger shanks than the Model BB. The outside diameter of the body is 2 3/4 in., the overhang of the body 3 1/4 in. and the overhang of the center point beyond the body is 1 5/8 in.

The center can be furnished integral with the tailstock on either old or new lathes.

Milling Machines

—75—

Milling Machines, "Garvin"

John B. Stevens, Inc., 27 Cleveland Place, New York, N. Y. [Vol.64,p.420.]

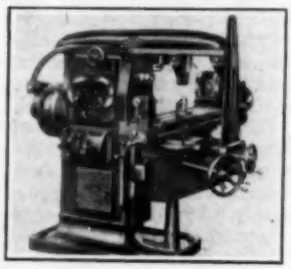
The entire line of milling machines and milling machine attachments formerly manufactured by the Garvin Machine Co., has been purchased by the above company. Production has begun once more on the more important items of this line, which is an addition to several Garvin lines of equipment taken over by this company.

—76—

Milling Machines, Improved, "Ohio"

Oesterlein Machine Co, Cincinnati, Ohio. [Vol.64,p.807.]

A complete line of improved milling machines has



been announced by this company in sizes of No. 1, No. 2, No. 2 Heavy, No. 3, No. 3 Heavy and No. 4. The accompanying illustration shows the V-flat overarm on the machine.

The overarm of the machine is of rectangular cross-section, with flat and V-guides forming the bearing and providing alignment of the arbor supports. The clamping of the overarm is done by means of a pair of T-slot bolts at the front and another pair at the rear.

The overarm is equipped with a rack that meshes with a pinion in the column. A handwheel on the end of the pinion shaft enables the operator to shift the overarm. For the replacement of arbors on cutters, the arbor supports are placed on the arbor and the overarm is brought forward into position by means of the handwheel. Both sides of the overarm have finished gaging strips scraped parallel with the center line of the spindle. These surfaces can be used as gaging points for squaring work, or for the location of gaging blocks.

—77—

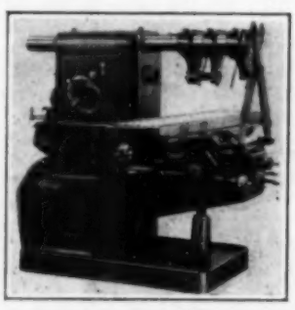
Milling Machines, No. 4B, "Milwaukee"

Kearney & Trecker Corporation, Milwaukee, Wis. [Vol. 64,p.881.]

The No. 4B milling machines are intended for railroad shops or for heavy-duty work, and are made in three models: plain, manufacturing and vertical. The drive is constant and is provided with 18 changes of speed through gearing. Timken roller bearings are used in the spindle drive except for the spindle itself and the idler.

The saddle and the knee are equipped with power rapid traverse, as is the table. The traverse is in all directions and controlled from the front. Eighteen feed changes are provided, from 8 to 25 in. per min.

Two automatic pumps are used to lubricate the ma-



chine. A coolant pump is also provided. The lubrication is generally centralized at three points.

The working surface of the table is 19x76 in., but a standard long table giving an increased longitudinal feed of 52 in. can be provided. Motor drive is used, although belt drive can be supplied if desired. The normal range of the machine is 42x14x20 in. The weight ranges from 10,800 lb. for the plain model to 12,400 lb. for the universal model.

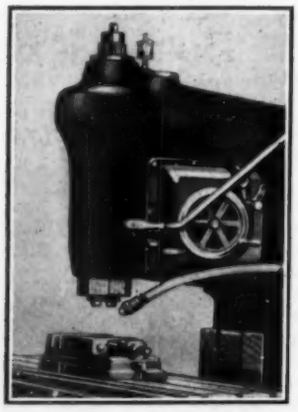
— 78 —

Milling Machine, Vertical, with Adjustable Spindle

Kempsmith Manufacturing Co., Milwaukee, Wis. [Vol.64, p.498.]

This machine is a modified form of this company's standard vertical Maximiller with an adjustable spindle. The head is designed for die sinking, tool making and other work requiring accurate adjustment of the spindle.

The spindle is mounted in an octagonal quill and on account of the large area of



contact no gibs are used. The upper end of the spindle has ten splines for the drive which is through herringbone gears, driven in turn through spiral bevel gears. A total adjustment of 6 in. can be obtained in both the No. 2 and No. 4 models.

Two large bronze bearings are provided in the quill for the spindle, the speeds of which are the same as on the standard vertical Maximiller. Spindle speeds 2½ times the standard may be specified, however, with ball bearing equipment.

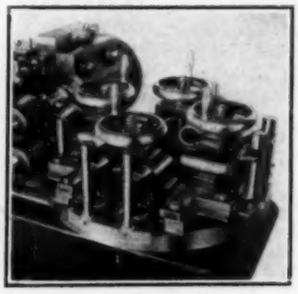
Power feed to the spindle is supplied in three speeds: 0.005, 0.009 and 0.014 in. per revolution of spindle. The feed is reversible and has a safety device to prevent overtravel. Hand feed through a wheel also has two feeds: 0.025 in. and ¼ in. per turn.

— 79 —

Pro-ducto-matic, Two-Spindle

Bilton Machine Tool Co., Bridgeport, Conn. [Vol.64,p. 36.]

The machine shown in the illustration herewith is a modification of the No. 8 Pro-ducto-matic. The two spindles are disposed in a vertical plane with relation



to each other and the movement of the cutters to the work is horizontal.

The horizontal movement of the ram is brought about by means of a double cam on the camshaft at the rear of the machine and it is positive in both directions. The spindle heads are mounted on the vertical face of the ram and are independent of each other. They can be adjusted vertically by means of screws.

The spindles are driven by a common intermediate gear that meshes with the pinions on the outer end of the spindles. This intermediate gear is carried upon a horizontally adjustable stud so that compensation may be made for varying center distances. The automatic indexing mechanism provides for four stations 90 deg. apart.

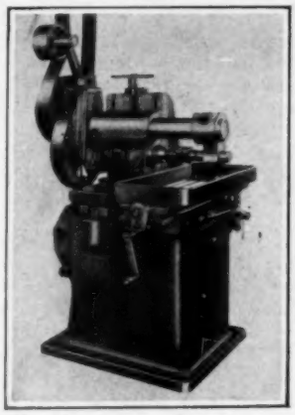
The drive to the spindles is through helical gearing. Belt or motor drive can be used. The machine weighs approximately 3,300 lb. and occupies a floor space of 42x60 inches.

— 80 —

Milling Machine, Automatic

Hartford Special Machinery Co., Hartford, Conn. [Vol. 64.p.217.]

The milling machine illustrated is specially designed for rapid production of manufactured parts within a limited range of sizes where the conditions are favorable to long runs upon one kind of work. It is automatic in its movements, and requires no attention from the operator except to unload and reload the work-holding fixture.



The machine is arranged for a single-speed drive by belt from either an overhead lineshaft or a special motor and the power is transmitted to the spindle through a train of speed-reduction gearing. The casting upon which the head is carried is pivoted to the base in such manner that it can be tilted to allow the cutters to clear the work during the return movement of the table. The amplitude of the movement is just sufficient to insure clearance and to prevent marking of the work. The table is actuated by a cam, which governs the amplitude of stroke as well as the movement which may be uniform, accelerated or intermittent as desired. One revolution of the cam shaft constitutes a cycle of the machine.

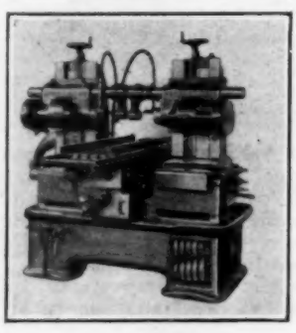
All rotating parts except the main spindle run upon ball bearings. The machine occupies a floor space of 58x42 in. and weighs approximately 2,000 pounds.

— 81 —

Milling Machine, Duplex, Automatic, No. 37

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.64,p.496.]

The No. 37 automatic duplex milling machine made by the above company is a two-spindle machine of the manufacturing type. Since it is of the duplex type, the



two uprights and the opposed spindles permit the use of two face mills or of two gangs of cutters working simultaneously. The machine is intended particularly for face milling operations, or, by using cutters on the arbors, the piece can be milled both above and below at the same time. The machine can be either belt or motor driven with a constant speed. The inside spindle rotates in one direction only at a speed determined by the change gears used. The outside spindle runs either forward or reverse at a speed also controlled by change gears. On work requiring the use of only one spindle, the outside spindle can be set to remain stationary.

Speed changes for both the spindle and the table are accomplished independently of each other. The spindle heads are mounted on uprights on each side of the table and each spindle is provided with independent vertical adjustments. The No. 37 machine is equipped with the Brown & Sharpe full automatic table control and both the fast travel and the cutting speed of the table operate automatically in either direction. The machine can also be set to stop at any point in the cycle. Multiple or angular heads, or simple horizontal and vertical heads can be used where necessary.

— 82 —

Milling Machine, Oil-Groove

Lehmann Machine Co., Chouteau and Grand Aves., St. Louis, Mo. [Vol.64,p.997.]

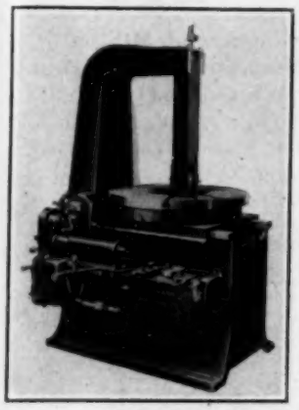
The machine shown in the accompanying illustration was designed primarily for railroad shop use to mill oil grooves in crown brasses for locomotives, but can readily be adapted to other work of a similar nature.

The machine is designed to cut two oil grooves in a crown brass parallel with the axis disposed at 45 deg. from the apex with two diagonal grooves connecting with the one end of each parallel groove with the reverse end of the other, and it can cut the diagonal grooves deeper at the apex where the brass is thicker and likely to wear the most.

A head carrying a three-groove end mill of the desired size travels in the slides of the central vertical column. This column is rigidly secured at the bottom

and is fastened at the top to the heavy main column which bridges over the back of the machine.

The table is provided with a device for holding the brasses in position and means are provided for determining the correct location. A lateral movement allows the cutter to be fed



into the brass to the desired depth. The table has a rotary movement which co-ordinates with the vertical movement to cut the diagonal grooves. A feed box with forty quick changes of speed controls the rotary movement of the table.

A 5-hp. motor is mounted on the back of the machine and drives through a silent chain. The capacity of the machine is from 7 to 14 in. in diam. and up to 22 in. in length.

—83—

Milling Attachment, Vertical, and Power-Feed Rotary Table, "Rigidmil"

Rockford Milling Machine Co., Rockford, Ill. [Vol.64,p. 696.]

The "Rigidmil" vertical milling machine has a heavy power-feed rotary table built into the machine. The rotary table unit is mounted directly in the saddle slide.

The drive is taken from the same gear that is regularly splined to receive the table screw. The worm for the feed is also driven from the same gear through a train of gears and a clutch. The feed gears can be changed.

The worm is provided with ball and thrust bearings, and the eccentric bronze bushings give adjustment for wear of the worm. The worm wheel is cast solid on the table. The table bearing is taken in three places and scraped into position. The table is locked into position by a clamp. The worm and wormwheel are submerged in a bath of grease.

The vertical spindle attachment is mounted on the regular spindle head. The attachment spindle has a flywheel splined to the upper end for the elimination of chatter. The spindle speed of the attachment is one-half that of the main spindle.

The diameter of the table is 17 in. and the maximum distance from the nose of the spindle to the top of the table is 9¼ in. The maximum endwise adjustment with long bed is 18 inches.

—84—

"Rigidmil," Double-Spindle, Special

Rockford Milling Machine Co., Rockford, Ill. [Vol.64, p.1000.]

The double-spindle "Rigidmil," illustrated, has a special indexing table. The machine is designed for milling

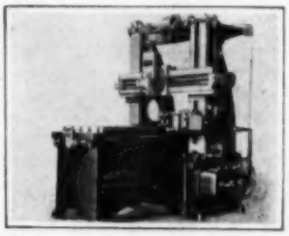
bolt bosses, and for slitting automobile connecting rods.

The two cutter heads of the "Rigidmil" are independently adjustable. The vertical adjustment of the two heads in unison is made from the main adjustment at the front of the machine, while the space between the upper and lower head is varied by means of a vertical screw.

The uprights are bolted and doweled to the base. The cross-rail is adjusted by power through double lifting screws. The tool slide in the vertical head has equal movement above and below the bottom of the rail. The vertical head can also be swiveled 45 deg. each way.

The base has a closed top and two surface bearings for the table. Side bearings and take-up gibs are also provided. The table is of double plate construction. Work can be positioned while the machine is stroking, by means of an adjustment block and screw. This block can be clamped during the cutting operation.

Six speed changes for the table stroke are provided through a gear box of the sliding type. The gears are hardened, inclosed, and run in oil. The table is controlled by means of a clutch



and brake, permitting "jogging" for the setting of tools. The clutch can be locked so that the machine cannot start unexpectedly.

The machine is driven through a 10-hp., 1,200-r.p.m. motor or by means of a single pulley, through a change gear box to a helical driving gear.

Planers, Shapers and Slotters

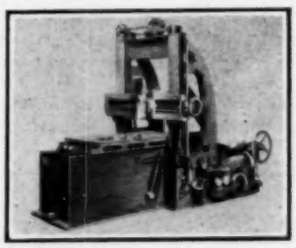
—85—

Planer, Crank, 36x36-Inch

Woodward & Powell Planer Co., 97 Webster St., Worcester, Mass. [Vol.64,p.221.]

The maximum stroke of the 36x36-in. crank planer, illustrated, is 42 inches.

The table is of box form and the work can be placed



upon it to come under the tool. The table drive is through a herringbone pinion and gear and a slotted rocker mechanism. The head is of the same size and design as that used on the company's standard rack-driven, 36-in. planer. It has the usual horizontal, vertical and angular feeds either by power or by hand. The cross-rail has power elevation.

Six changes of speed are furnished on this model. They are 6, 8, 12, 17, 24 and 34 strokes per min. The charges are made through sliding gears. A dial indicates the length of the stroke.

The machine can be driven from a single pulley belt or from a 10-hp., constant-speed motor.

—86—

Planer, Crank, Side-Head, "Newton"

Newton Works of the Consolidated Machine Tool Corporation of America, Rochester, N. Y. [Vol.64,p.577.]

The "Newton" crank planer, illustrated, is built in two sizes for either a 34- or a 39-in. stroke.

The side head has a vertical feed and hand adjustment. If desired, each upright can be equipped with a side head. This head can be lowered below the top of the table when necessary. It can be swiveled 45 deg. to either side of the horizontal and is balanced by means of a counterweight.

—87—

Detrick & Harvey Products

Manning, Maxwell & Moore, Inc., 100 East 42nd St., New York, N. Y. [Vol. 64,p.579.]

Manning, Maxwell & Moore, Inc., have acquired the right to manufacture and sell the products of the Detrick & Harvey Machine Company.

The manufacture of the Detrick & Harvey openside, double-housing and convertible planers, as well as floor boring, drilling and milling machines, will be continued at the Putnam Works of Manning, Maxwell & Moore, Inc., located at Fitchburg, Mass. Special tools and repair parts can also be obtained for the Detrick & Harvey machines.

— 88 —

Shapers, Improved

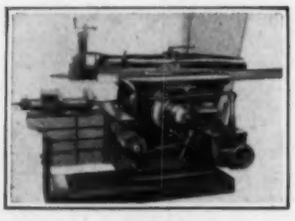
Gould & Eberhardt, Newark (Irvington), N. J. [Vol. 64,p.848.]

A number of improvements have been made in the line of shapers manufactured by this company. The improved 32-in. "Invincible" is illustrated.

An automatic forced-feed lubricating system is provided that takes care of all reciprocating sliding surfaces. The oil is led to the bearing surfaces by means of copper tubes and the pressure in the system is controlled by a by-pass valve. The overflow is returned to a reservoir in the base of the machine. On the operator's side of the machine there is a window through which the oil may be seen.

The top of the table has been extended and the T-slots are machined to permit the accurate location of fixtures. The base of the machine has also been lengthened to secure better support for the table. The supporting member has a wide base that rests on a removable bar secured to the machine base.

Power is transmitted from the drive shaft, to a disk



clutch that is mounted on Timken roller bearings. The position of the shear pin in the clutch may be changed so that a light or heavy load can be carried.

The vise is of the plate-type and is bolted to the table with T-head bolts in the regular slots. It has jaws close to the table, and its angular graduations are on a large diameter.

— 89 —

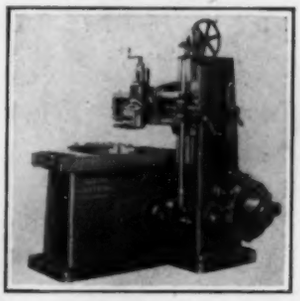
Shapers, Open Side, Universal, 26- and 36-Inch

Rockford Machine Tool Co., Rockford, Ill. [Vol.64,p.961.]

The universal open side shaper, built in two sizes, having strokes of 26 and 36 in., has ball bearings throughout. The machine is equipped for either individual motor or single pulley drive.

The machine is controlled by means of a lever to a friction clutch and brake. A rocker-arm mechanism is adopted. Eight changes of stroke speed can be obtained through sliding gears mounted within the column.

The two sizes of machines are similar in design but the



36-in. machine can be equipped with a side head. The 36-in. machine also has a special mechanism for the table movement because of the length of the stroke. On both the machines provision is made for positioning the stroke so that it will be convenient for the work. Provision is made for the lubrication of the bearings by means of a perforated oil tube which runs through the table over each bearing. Felt wipers are inserted in slots opposite the openings in the oil tubes and the lubricant is distributed through the wipers over the bearings.

The 26-in. machine provides for a horizontal travel of the tool of 23 in. The vertical travel of the tool is 9 in. The working surface of the table is 18x38 in. The height of the machine from the floor to the table is 36 in. A 7½-hp., 1,800-r.p.m. motor is required to drive the machine. The shaper weighs about 6,000 lb. without the motor.

The horizontal travel of the tool on the 36-in. machine is 30 in. The working surface of the table is 21x44 in. A 10-hp., 1,800-r.p.m. motor is recommended for the machine. The weight of the shaper without the motor is about 7,200 pounds.

— 90 —

Slotting Machine, "Dill"

Nazel Engineering & Machine Works, 4041 North Fifth St., Philadelphia, Pa. [Vol.64,p.179.]

This company has purchased from the T. C. Dill Machine Company all rights and titles to the Dill slotting machines. They will be manufactured at the Nazel plant in Philadelphia.

— 91 —

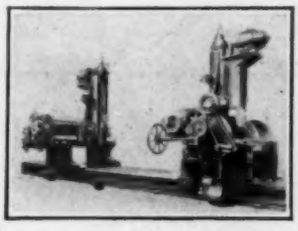
Slotting Machine, Locomotive-Frame

Betts Works of the Consolidated Machine Tool Corporation, Rochester, N. Y. [Vol.64,p.259.]

The locomotive-frame slotting machine, illustrated, is equipped with two heads, but it can be furnished with one or three heads also, if desired.

The bed consists of a wide, deep casting with narrow guiding surfaces for yokes. The faces on which the yokes bear are chilled to secure a hard smooth surface. The top is provided with suitable T-slots for clamping the work. Both sides of the bed are equipped with stationary leadscrews and revolving nuts.

Each yoke has a separate electric feed and power rapid traverse along the bed. A single driving motor is mounted on each yoke and performs the same functions for the saddles as well. Handwheels provide fine hand adjustment.



The cross-rails are arranged with either hand or power swiveling movement for angular slotting. The feed is adjusted by means of graduated feed plates located conveniently for the operator. Independent feed to the yoke and saddle is provided.

Each ram is driven by a 20-hp. reversing motor that has a high return speed ratio. Cutting and return speeds are independently adjustable by means of separate rheostats for each. Push-button control is used throughout.

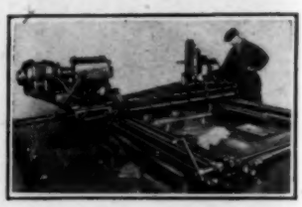
The rams are counterbalanced and are entirely self-contained. The mechanism is driven through spiral-bevel gears. A mechanical knock-out device is provided to prevent over-travel. The length of the stroke is adjustable by means of dogs which operate a master switch controlling the driving motor.

— 92 —

Shaper and Milling Machine, Combination, "Whitcomb-Damerell"

Reed-Prentice Co., Worcester, Mass. [Vol.64,p.339.]

The "Whitcomb-Damerell" portable draw-cut shaper is being equipped with an attachment suitable for milling



the clearance for the cutting tool when the shaper is being used to replane the pockets for uprights on steam and drop hammer bases.

The motor used on the attachment is a standard 1½-hp. electric drill operating at 180 r.p.m. The construction is said to be sufficiently rigid so that a cut ⅛ in. deep can be taken.

The shapers are built in two sizes to handle surfaces 48 and 66 in. square. The bridge is of heavy angle cross-section, ribbed at short intervals. It is supported at each end by means of a saddle scraped to rails and operated through long screws controlled by a crank handle at one end of the rail to secure the required adjustment.

The power is derived from a 3-hp., 1,800-r.p.m. a.c. motor, or a 3-hp., 1,700-r.p.m. d.c. motor. The machines weigh 2,600 and 3,077 lb., respectively.

Presses

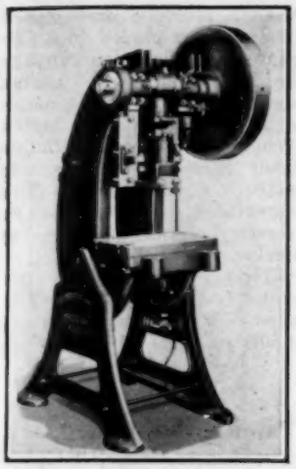
— 93 —

Press, Inclinable, High-Speed, No. 3

Federal Press Co., Elkhart, Ind. [Vol.64,p.539.]

The high-speed, open-back, press, No. 3, illustrated, has a bed that may be inclined from 0 to 40 deg. About 23 tons pressure is developed at the bottom of the crank stroke with a 2 hp. input at 125 revolutions per minute.

The ram has a hand-scraped fit in the V-shaped guides. It is provided with positive knock-out and has a ball and socket connection



with the connecting rod. The ram has a square hole for round or square punch shanks. Extension lugs are provided for holding large dies. Lubrication of the ram is effected by means of oilers and oil grooves. The high-carbon steel connecting rod has a screw adjustment in the solid ball. The standard stroke is 2½ inches.

The flywheel has a solid web and holes in the rim for turning by hand. The flywheel shaft has a cast-iron bushing. The wheel is fitted with replaceable hardened tool-steel driving and recoiling pins. The clutch is of the square sliding type made of tempered tool steel. The crankshaft is a high-carbon steel forging.

The tripping mechanism is operated by foot. The bolster plate measures 12¾x21½ in. and the die space is 7 in. The face of the ram is 7½x6 in. The space occupied is 34x 41½x78 in. The weight is about 2,340 pounds.

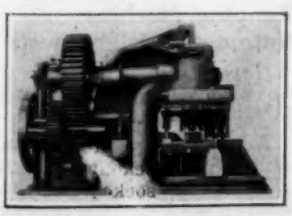
—94—

Punching Machine, Open-Gap

Cleveland Punch & Shear Works Co., Cleveland, Ohio. [Vol.64,p.921.]

An open-gap punching machine that will punch both the flange and the web of steel beams without changing the tool set-up has been brought out. The machne can also be used for punching plates.

The capacity for punching is 8-in. to 30-in. Bethlehem



girder beams and Bethlehem H-beams ranging in size from 8 in. to 14 in. By placing an overhanger at the rear of the throat standard 6-in. to 9-in. H-beams and standard I-beams can be punched without changing other set-ups of tools.

The punching tools are arranged in three standardized rows parallel to the main shaft. With the distance between the rows fixed, connecting angles can be punched with the same set-up as employed for the webs and flanges. The punching tools are hand gaged and are adjustable from a minimum of 2¼ to a maximum of 48 in. apart.

The machine is driven by a direct-connected 40-hp. motor. The over-all dimensions are: height, 15 ft. and 3 in., and length 15 ft. and 9½ inches.

—95—

Press-Lever, Bench

Baum's Metal Specialties, 1523 Wyandotte St., Kansas City, Mo. [Vol.64,p.926.]

The bench lever press illustrated has been placed on the market for the punching,

forming and blanking of light metals, where a portable bench press is desirable.

The press has a capacity of 5,000 lb. pressure and will blank sheet metal ⅛ in. thick that has a cutting edge of 6 or 7 in. It will punch holes in sheets ¼ in. thick. Small dies can be used on the press when it is to be used for forming or bending.

The length of the lever is 36 in. The height of the press is 11 in. and its weight is 35 pounds.

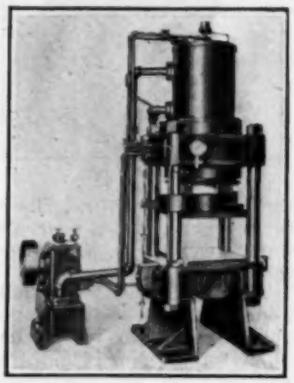
—96—

Press, Hydraulic, 300-Ton

Oilgear Co., 659 Park St., Milwaukee, Wis. [Vol.64,p. 1003.]

The 200-ton hydraulic press illustrated is designed especially for the pressure forming of soft base bearings.

The press is of the four-column type. Its stroke is 6 in., and its clearance between the columns is 24 in. The press has a rapid approach to the work at a rate of 100 in. per min. and a quick return at the rate of 200 in. per min. The line pressure can be adjusted to between 300 and 1,000 lb. per sq.in. The press is capable



of making ten 6-in. strokes of 200-tons pressure per minute.

The machine will hot press bearings on which it is used at a temperature sufficiently low to leave the analysis of the metal unchanged. It is so constructed that it will hold the maximum desired pressure for an indefinite length of time, if necessary, to allow cooling.

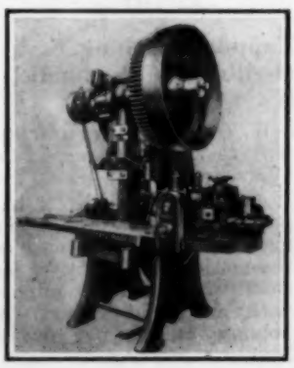
The pump is mounted on a base adjoining the machine. From the pump the oil is transmitted to the cylinder where it is applied directly to the piston or to the ram of the machine.

—97—

Roll Feed, Heavy-Duty, Automatic

F. J. Littell Machine Co., 4125 Ravenswood Ave., Chicago, Ill. [Vol.64,p.337.]

A heavy-duty automatic roll feed has been designed to handle cold-rolled stock 0.137 in. thick and 4 in. wide, and also 14-gage stock 8 in. wide. A power-driven, three-roll



straightener, is also part of the unit. The feeding rolls are made from tool steel, hardened and ground. The straightening rolls are also hardened and ground. They are power driven and are connected through gearing to the feeding rolls, which are 6½ in. in diam. and 8½ in. wide.

The illustration shows the attachment mounted on the bolster plate of a press. It can feed from 0 to 11 in. at each stroke. The equipment is particularly adapted for blanking hinges and heavy hardware. It can be made to fit any punch press.

—98—

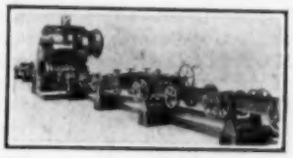
Spacing Machine, Hand Operated

Stiening Spacing Machine Co., 1016 Empire Bldg., Pittsburgh, Pa. [Vol.64,p. 541.]

Improvements have been made in the spacing machine manufactured by this company. It can be used in connection with a multiple punch already installed.

The table is of the triple-pass type and is arranged to handle plates, angles, beams, columns and other shapes for web and flange punching. It will handle pieces up to 40 ft. in length. One pass of the table can be arranged with rollers to permit using the table for both web and flange punching.

The spacing and trailer tables are of rigid steel construction and are supported on heavy cast-iron pedestals.



The material grippers are of cast steel with tool steel inserted jaws. The templet is of high-carbon steel and the templet pins are of tool steel. The set-up is accomplished by inserting the templet pins in the templet at the required spaces. Fractional spacings of sixteenths of an inch may be obtained.

When the material has been placed on the table it is gripped by means of a device on the spacing carriage. The trailer carriage is equipped with a lever-operated trailer gripper which releases near the end of the spacing and which is used only when punching plates. Other materials are gaged at the punch and need not be held by the

trailer gripper. A centering device is provided. The spacing carriage which feeds the material is manually controlled by the operator who propels it by means of a large handwheel.

The travel of the carriage is arrested against the templet pins. After the punching operation the operator disengages the templet dog by means of a lever located near the handwheel. He then feeds the material until the dog engages the next templet pin.

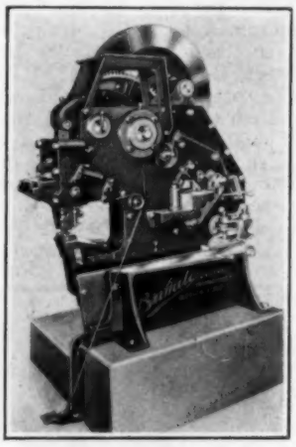
— 99 —

Copers, Built-In, for Universal Iron Workers

Buffalo Forge Co., 448 Broadway, Buffalo, N. Y. [Vol.64,p.879.]

The Nos. ½ and 1½ universal iron workers are being constructed with built-in copers, as illustrated.

The coper is built on the punch end of the machine and is operated by the same controls either hand or foot, as is the punch. A sheet-



steel cover guard, not shown, is provided to fit over the coper in order to protect the worker.

The No. ½ coper will handle 5-in. channels, 6-in. beams, and angles 3x3x$\frac{7}{16}$ in. The coper for the No. 1½ machine will take 6-in. channels, 7-in. beams and 3x3x$\frac{5}{8}$-in. angles. It is claimed that only one cut is required for full depth on all sections.

Threading Machines

— 100 —

Tapping Machine, Oscillating, Pneumatic, No. 8, Improved

W. Gaterman Manufacturing Co., Franklin & 15th Sts., Manitowoc, Wis. [Vol.64,p. 182.]

The improved pneumatic oscillating tapping machine, No. 8, has the same principles of construction and operation as those of the former models. All rotating parts have been inclosed in guards.

Those machines that are equipped with an oil pump are provided with a fine-mesh combination strainer and chip pan mounted beneath the table. The motor or countershaft is mounted on the oil tank which is cast integral with the base of the machine.

The capacity in steel of the No. 8 machine is from ¼ to ¾ in. With a back-geared attachment, it is 1¼ in. The tapping depth can be up to 3 in. and with a special arrangement can be up to 9 in. The distance from the spindle to the column is 13 in. The table inside the oil channel, is 22¼ in. square. Vertical adjustment of the table is 21 in. Spindle speeds of 195, 275, 390 and 670 r.p.m. are available. The height of the machine is 70 in. and it weighs about 1,000 lb. A 1½-hp., 1,750-r.p.m. motor is standard equipment.

— 101 —

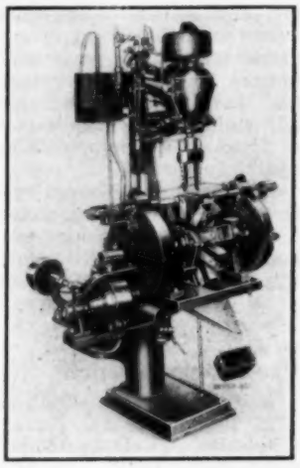
Tapping Machine, Oscillating, Pneumatic, No. 4A1

W. Gaterman Manufacturing Co., Manitowoc, Wis. [Vol.64,p.376.]

An improved No. 4A1 pneumatic oscillating tapping machine has been placed on the market. The illustration shows the machine equipped with a special fixture for holding electrical switch boxes.

The operation of the machine is fully automatic. The operator needs only to load the fixture which has a dial feed. The parts are automatically clamped and discharged. The same type of machine can be furnished for various parts having one or more vertical and horizontal holes to be tapped.

The operation of the spindle is such that when the



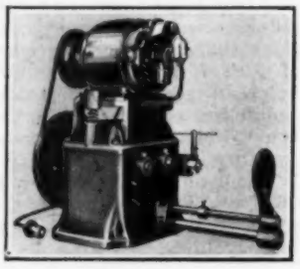
strain on the tap reaches a certain amount, the limit of which is adjustable, the tap is slightly backed off the work.

— 102 —

Tapping Machine, Three-Speed, No. 2

Alto Manufacturing Co., 1647 Wolfram St., Chicago, Ill. [Vol.64,p.537.]

The No. 2 three-speed tapping machine is driven by either an a.c. or a d.c. electric motor mounted on top of the machine and having a three-step cone pulley. The base of the motor is pivoted at the rear and is held against the



belt tension by means of a coil spring. The belt may be readily shifted by depressing the motor base against the spring. The tapping spindle is driven forward at 150, 300 and 450 r.p.m. It reverses at 300, 600 and 900 r.p.m. The power of the motor is sufficient to drive a ¾-in. tap in cold-rolled steel.

The machine is provided with a multiple disk clutch. The work is placed on a face plate, to which jigs can also be attached, and pushed against the tap. The action engages the driving clutch. When the proper depth has been reached, the operator pulls on the work. This movement engages the reversing clutch and the tap backs out.

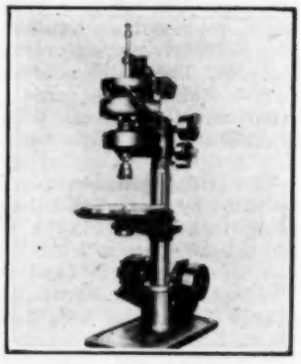
The capacity of the machine is for from ¼- to ¾-in. taps. The net weight is 8,500 pounds.

— 103 —

Tapping Machine, Automatic, No. 2-BG, Improved, "Garvin"

Western Machine Tool Works, Holland, Mich. [Vol. 64,p.883.]

The improved "Garvin" automatic tapping machine, No. 2-BG, illustrated, is similar in design to the No. 2-X tapping machine described on page 829, Vol. 60, of the *American Machinist*, but it is of larger capacity through the use of back gearing. Guards are provided for the gearing, for the low-speed



forward pulley and the high-speed reverse pulley.

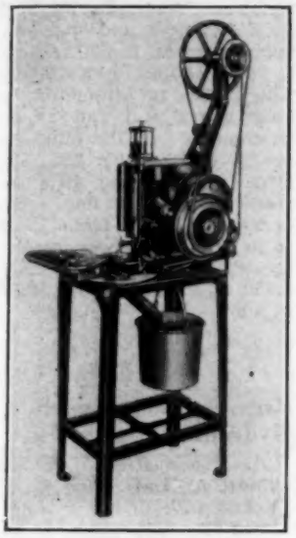
The machine is driven by means of a 1½-hp. motor, the base of which is cast integral with the machine base. A positive-drive tap chuck is fitted to the lower end of the floating spindle. The capacity of the machine in cast iron is 1¼ in. U. S. standard tap or ¾-in. pipe taps. The maximum depth is 2½ in. The table can be adjusted 20 in. vertically.

— 104 —

Tapping Machine, Automatic, High-Speed

Hart & Hegeman Manufacturing Co., Hartford, Conn. [Vol.64,p.925.]

An automatic tapping machine designed for high-speed production work has been placed on the market



for small sheet-metal parts that are hard to jig for the tapping operation.

The tapping spindle is driven by a three-step cone pulley giving, 45, 65 or 85 strokes per min., which is equivalent to the normal number of holes that can be tapped per minute. For special work, however, this speed can be increased. The normal speeds are 1,350, 1,950 and 2,550 revolutions per minute.

The machine uses dials of three diameters, 6½, 8½ and 10½ in. The dial is rotated by a pawl. A safety clutch is provided in order to stop the tapping spindle if the dial does not index properly. A knockout mechanism pushes the piece down through the feeding dial after the tapping is completed.

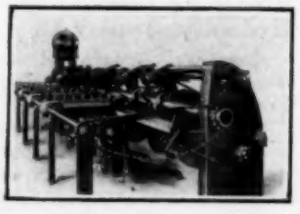
Collets are furnished to hold taps up to ¾ in. in diam. The machine is built for either bench of floor use and is furnished with motor or countershaft drive. The shipping weight is 440 pounds.

— 105 —

Threading Machine, Pipe, Single-End, "Rotomatic," Davis

William K. Stamets, Jenkins Arcade Bldg., Pittsburgh, Pa. [Vol.64,p.538.]

The Davis "Rotomatic" pipe-threading machine, manufactured by the Davis



& Thompson Co., is designed to automatically pick up, grip, thread and discharge the pipe. The conveyor has power-driven rolls for advancing the pipe to a stop.

The headstock is a single casting. All rotating members are inclosed and automatically lubricated. The gears and spindles are of heat-treated steel and the spindle-driving keys are of the anti-friction type. The drive is through a variable-speed motor mounted on the head-stock and belt-connected to the driving pulley.

There are six spindles for threading. Their longitudinal movement is controlled by means of floating and positive cams. The die-heads screw on the spindles and the die closing mechanism is automatic. Coolant is supplied by means of a motor-driven pump located in the base of the machine.

The six-station work drum rotates in synchronism with the spindle drum. The automatic conveyor takes the pipe from the table and carries it over power-driven rolls which advance it to a stop in line with the dies. The pipe then goes to the loading-station and thence to the chuck jaws. After being released by the chain clamp, the pipe is discharged on the opposite side of the machine. The conveyor will handle pipe of from ¼ to 2 in. in diam. in random lengths up to 22 feet.

The diehead is internally tripped and can be set for any number of threads. The dies can be adjusted for size without removing the heads from the spindles. The pipe can be reamed during the threading operation.

— 106 —

Threading Machine, Pipe, Double-End, Automatic, Model J

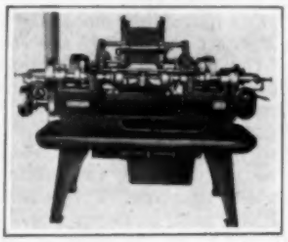
Cleveland Automatic Machine Co., Cleveland, Ohio. [Vol.64,p.579.]

The model J automatic double-end threading machine is built in two sizes, and it is intended for production threading of pipes, nipples and studs or milling the bearing diameters on both ends of shafts as well as for the simultaneous drilling or chamfering of both ends.

The machine is equipped with a hopper magazine. The magazine is provided with oscillating levers timed from the camshaft to control the dropping of the parts to sliding conveyor fingers which carry each piece to the air-operated center chuck. The center chuck on the model J machine holds the work stationary while the tools are rotated.

The machine is driven by means of a single-pulley belt or a motor, through a clutch in the driving pulley. The engaging and disengaging of the tool feed is accomplished by means of a hand lever.

The feed wormgear is provided with a safety shear-pin device. Two drums on the camshaft furnish the tool



feed to the two tool spindles through cams mounted on the circumferences of the drums. Cams on the side of the tool feed drum operate the finger conveyors in the magazine. A disk on the camshaft operates the lever controlling the feed of parts to the conveyor fingers. A drum on the camshaft operates the air cylinder for opening and closing the floating center chuck. Four spindle speeds are provided for by means of change gears.

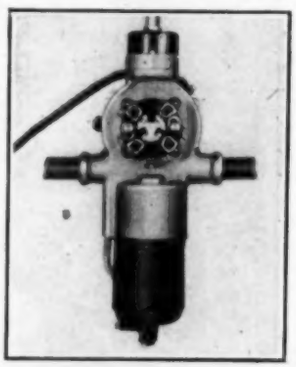
The coolant is carried through the tool spindles and dieheads in a constant stream.

— 107 —

Die-Stock, Electric

Oster Manufacturing Co., Cleveland, Ohio. [Vol.64,p. 693.]

The electrically operated die-stock for threading ⅜-, ½- and ¾-in. pipe is driven by a fully-inclosed universal motor that operates on either direct or alternating current of 110 volts; 25 to 60 cycles.



A separate diehead is used for each size of pipe, and the change from one size to another is made by pulling out a pawl that holds the head to the rotating sleeve. The dies are adjustable for over- and under-size threads. The tool is placed on the end of the pipe, which is held stationary, and is centered by means of a universal chuck.

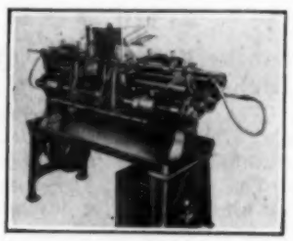
A switch is placed at the top of the tool. A quarter-turn of this switch starts the motor for cutting the thread, the next quarter-turn stops the motor, and the following quarter-turn reverses the motor and backs the dies off the thread.

— 108 —

Threading Machine, Double-End, Automatic

Grant Manufacturing Co., 85 Silliman Avenue, Bridgeport, Conn. [Vol.64,p.694.]

An automatic double-end threading machine arranged especially for hollow milling, facing and drilling both ends of sewing machine pitmans has been brought out by this company. The machine has



two independent and opposing heads, which hold the various tools for performing the operations required on work up to ⅝ in. in diam. and 18 in. long. The heads are moved along the bed by means of two cams.

A magazine hopper at the center of the machine carries the rods upon which the operations are performed. The spindles of the machine are gear driven. They are hollow and through them the coolant for the tools is forced by means of a pump at the rear of the machine. The machine is regularly driven from an individual motor through a chain, but a belt drive can also be provided.

— 109 —

Thread Generator, Improved

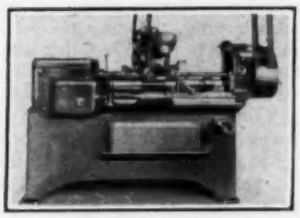
Fellows Gear Shaper Co., Springfield, Vt. [Vol.64,p. 497.]

Improvements in the thread generator previously described on page 923, Vol. 58, of the *American Machinist* have been made by its

builders. The machine is provided with a reversing and quick-return mechanism.

The driving mechanism, consisting of a gear box and two pulleys, is now at the right-hand end of the machine. The larger pulley operates the drive for cutting while the smaller pulley acts as an idler and, through the quick-return gear box, furnishes the drive to return the cutter slide to the starting position.

The differential mechanism that synchronizes the movement of the cutter and of the work, as the latter is fed longitudinally, has been simplified in the present model so that for cutting right and left-hand threads no changes are necessary in the mechanism itself. A clutch has been added so that the power feed can be engaged or disengaged as desired for convenience in setting up the machine. Three types of control mechanisms are provided for various depths of cut. A worm adjustment for setting the cutter to the proper depth is provided also.



For individual motor drive, a bracket fastened to the rear of the bed carries a trunnion upon which an additional bracket is held and to which the motor is fastened, so that the pulley on the motor will line up with the two pulleys on the machine. The tension of the belt is taken care of through an adjustable set-screw.

Other Machine Tools

—110—

Sawing Machine, Cut-Off, High-Speed

Hunter Saw & Machine Co., 57th & Butler Sts., Pittsburgh, Pa. [Vol.64,p.657.]

The model 1-A, high-speed metal cutoff saw is designed

for the cold cutting of light-section, pressed and drawn steel shapes.

The saw is driven by endless belt from a 7½ or 10-hp. motor keyed to the base. Both the belt and the saw are provided with steel safety guards.

The table has a quadrant stop that can be set to any angle within the range of the saw blade. The material is held by means of a double-jaw, quick-acting eccentric vise.

The machine carries a 24-in. diam. saw. Its weight with a 10-hp. motor is 1,500 pounds.

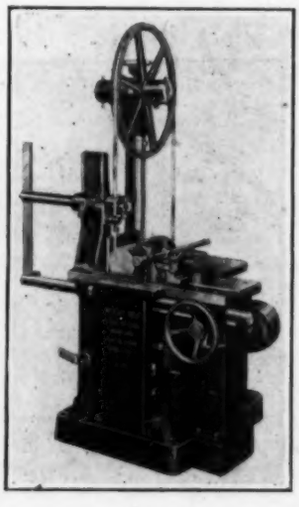
—111—

Saw, Band, Metal-Cutting, No. 4

E. C. Atkins & Co., Indianapolis, Ind. [Vol.64,p.999.]

The No. 4 metal-cutting band saw has been placed on the market. The machine is motor driven through a three-speed gear box. Roller bearings are used throughout and the gears run in oil. All shafts and gears are hardened.

The amount of weight put on the rack determines the pressure of the blade, which is fed by gravity. The blade runs between roller bearing guide rolls to insure the straightness of the cut. A handwheel adjusts the tension on the blade. The machine is operated by a ¾-hp. motor.



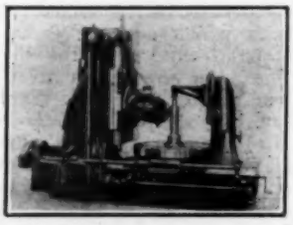
It is claimed that the saw will cut machine steel at the rate of 2 sq. in. per min., and tool steel at the rate of 1 to 1½ sq. in. per min., depending on its hardness and toughness. The capacity of the machine is 12x18 in. The table is 28 in. from the floor and 13x32 in. in size. The height of the machine is 74 in., the floor space occupied is 36x50 in., and the weight of the machine is 1,500 pounds.

—112—

Hobbing Machines, Gear, Automatic, Improved, "Pfauter"

O. Zernickow Co., 15 Park Row, New York, N. Y. [Vol. 64,p.494.]

The line of "Pfauter" automatic gear hobbing machines, marketed in this country by the above company, is being



equipped in the larger sizes with a hydraulic table load-balancing device, and several improvements in the construction of the machine have been made. Spur, worm, helical and herringbone gears, sprockets, ratchets, circular saws and spline shafts can be generated on these machines, the No. 4 size of which is illustrated. The main drive can be from a motor or from a countershaft to a three-or four-step cone pulley. Double back gearing for heavy work is provided on all but the smallest of the ten models. The hob drive is through transmission elements from the main shaft.

On the No. 5 and No. 6 machines the weight of the large gear blanks is relieved by means of a hydraulic table load balancing device. The entire weight of the gear blanks and blank supports and three-fifths of the weight of the table are placed on an oil cushion to secure liquid friction. The remaining two-fifths of the table weight have mixed or semi-fluid friction as a result of the large bearing surfaces and the resulting small unit pressure.

The machines are built in ten sizes, Nos. 000, 00, 0, ½, 1, 2, 3, 4, 5 and 6. They require ¾, 1, 1½, 2 3, 4, 6, 8, 15 and 20 hp., respectively. The maximum diameters of spur gears that can be accommodated by the machines are 4, 8, 13¾, 19½, 29½, 39¾, 59⅞, 87, 118 and 157½ in., respectively. The floor space occupied ranges from 17x29 to 98x216 in. Their weights are 690, 1,200, 1,700, 2,800, 3,600, 4,950, 12,000, 21,200 41,800 and 82,000 pounds.

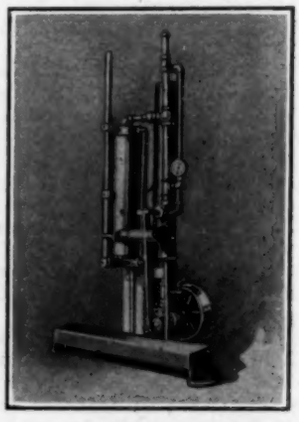
—113—

Press, Broach, Bench, Hydraulic

American Broach & Machine Co., Ann Arbor, Mich. [Vol.64,p.77.]

The hydraulic bench broach press illustrated is for general operations requiring a small press with a capacity of up to two tons pressure.

The machine has a cylinder 4 in. in diam. and made from gray iron. The oil is pumped directly over the full area of piston. The pump is of the continuous-flow type and when the machine is not in operation the oil is by-passed



from the controlling valve into a reservoir above the pump. The return stroke is secured from the two springs that operate automatically.

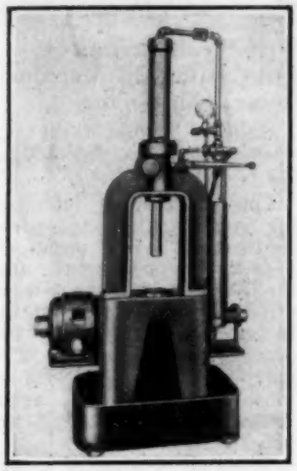
The longest stroke of the press is 13 in., and it can be set to shorter lengths as desired. The diameter of the ram is 2 in. and the bore in the table is 2½ in. in diam. The weight of the machine is 373 pounds.

—114—

Broaching Press, Hydraulic, Type V-18

American Broach & Machine Co., Ann Arbor, Mich. [Vol.64,p.179.]

The type V-18 hydraulic press, illustrated, has been designed for broaching, assembling and straightening



work. The ram is 2½ in. in diam. and has a stroke of 18 in.; the cylinder is 4 in. in diam. The end of the ram is tapped to receive broach connections. The table is bored central with the ram, the hole being 5 in. in diam. The speed of downward travel of the ram may be varied from 0 to 16 ft. per min. The ram is returned to the loading position by means of springs.

The capacity of the press is from 6 to 8 tons. A relief valve can be set so that a designated pressure can be maintained. The pump is of the twin-screw type. It has no packing glands under high pressure. A coolant pipe is also furnished. A 5-hp. 1,750-r.p.m. motor is recommended to drive the pump through a flexible coupling.

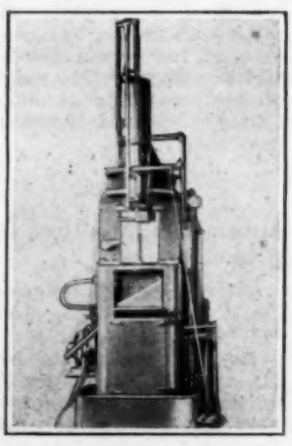
The weight of the machine is 1,900 lb. and the operating floor space required is about 5 square feet.

—115—

Broaching Machine, Hydraulic, Vertical, Pull-Type

American Broach & Machine Co., Ann Arbor, Mich. [Vol.64,p.420.]

A pull-type vertical hydraulic broaching machine



has been added to the line of this company. When the machine is in a loading position, the end of a shank projects through the angular table. The work can be dropped over the shank of the broach, and from this point the broach is raised until it connects automatically with the pull head. When the broach connects with the pull head the operator turns the foot slightly, pressing a second pedal which starts the pulling ram. After broaching, the work is dropped onto the angular table and slides down a chute at the left.

The head automatically releases the broach by means of a latch attached to the left-hand vertical member of the frame. The broach then drops through a distance of about 5 in., passing through a second metal guide in the angular table and into a soft metal bushing in the upper end of the cylinder.

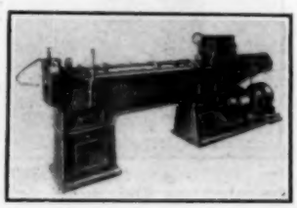
The machine will accommodate broaches up to 18 in. in overall length. The machine is furnished complete with a full-flow, twin-screw type, constant pressure pump and supply tank. A 5-hp., 1,800-r.p.m. motor is recommended. The press requires a floor space of about 5 sq.ft. and it weighs approximately 3,400 pounds.

—116—

Broaching Machine, Hydraulic, 3L

J. N. Lapointe Co., New London, Conn. [Vol.64,p.654.]

In the improved hydraulic broaching machine, illustrated, the pressure moving the draw-bar is supplied by a Hele-Shaw rotary pump of the variable delivery type.



The pump can be driven by a belt or by a direct-connected, constant-speed 7½-hp. motor.

The cylinder is of 7-in. bore. The ports and passages are cast integral with the cylinder. The control valves are cast separately and gasketed to the cylinder. The draw-rod operates up to a maximum of 24 ft. per min. The return stroke of the bar may be from 10 to 60 ft. per min. The full length of the working stroke is 56 in., but the length can be limited by stops. The maximum pressure of oil allowable is 1,000 lb. per sq.in., and a permanent relief valve is set to bypass the oil at this pressure. The return pressure is 240 lb. There is never any pressure in the system except between the pump and the piston.

Coolant for the broaching tools is supplied by a Brown & Sharpe geared pump that is belted directly to the drive shaft or motor. A tank in the cabinet leg contains the liquid and provides for straining and settling. The trough of the machine under the broach is so shaped that the chips and coolant flow to the removable chip pan, through the perforated bottom of which the liquid drains to the tank. The draw-head is fitted with bronze shoes to slide upon a guide-way in the trough of the machine to insure alignment.

—117—

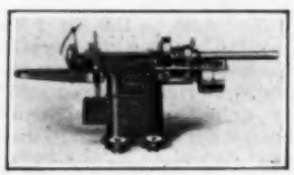
Broaching Machine, Special, No. 2

Lapointe Machine Tool Co, Hudson, Mass. [Vol.64,p.965.]

The special short-stroke broaching machine is for small work, such as round holes and small keyways.

The No. 2 machine will broach keyways ¼x¼x2½ in. in steel, round holes up to 1¼ in. in diam. and square holes ¼x¼x2½. The draw bar is screw driven. The screw is about 2 in. in diam. and is fitted with a bronze nut 7 in. long. The length of the stroke is 24 inches.

The driving pulley operates at about 600 r.p.m. Cutting speeds of 48, 72, 96 and 120 in. per min. can be obtained. The return of the draw bar is at approximately 3½ times the cutting speed.



There is a vertical adjustment to the draw head ranging from 1 in. below to 1¼-in. above the center of the hole in the faceplate.

The floor space occupied is 114x20 in., this space allowing for the screw guard and drip pan. The net weight is about 1,250 pounds.

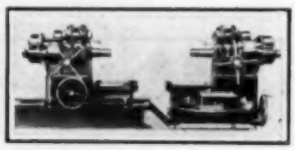
A similar machine, the No. 3 special, is made to the same specifications, except that the stroke is 20 inches.

—118—

Facing Machine, Pipe-Flange

Rockford Drilling Machine Co., Rockford, Ill. [Vol.64,p. 806.]

The machine shown in the accompanying illustration was built especially for facing the flanges on large-diameter pipe after the flange



is welded on the pipe. The machines consist of two units that are made to travel on I-beams so that long and offset pipe can be accommodated.

The left-hand unit is mounted so that it can be moved along the rails on I-beams for a distance of about 20 ft. parallel to the center line of the spindle. The rails for the right-hand member are set perpendicular to those for the left and also allow about 20 ft. of movement. A rack-and-pinion feed is used for traversing the two units along the beams. The traverse is operated by means of a large handwheel.

Direct-connected motors drive the spindle through reduction gears. Pick-off gears are provided so that speed changes can be obtained. The spindle has a very short feed by hand only. The sleeve bearing in the head is provided with a clamping device so that the sleeve can be held rigidly in place.

—119—

Quartering, Machine, Wheel, 90-Inch, "Niles"

Niles-Bement-Pond Co., 111 *Broadway, New York, N.Y.* [Vol.64,p.884.]

The machine illustrated is for boring simultaneously crankpin holes in locomotive driving wheels, and, by means of a special attachment, crankpins mounted in the wheel sets can also be turned. The illustration shows the machine with the crankpin-turning attachment in place. The design provides for wheel sets that have right hand lead only.

The bed is 28 ft. long and 24 in. deep. The center to center distance of the ways is 48 in. The heads are adjustable laterally along the bed by power. The boring bar is 4½ in. in diam. and is provided with hand and

power traverse for lateral movement. The feed mechanism for the spindle is contained in the saddle and two reversible feeds of 1/32 and 1/16 in., are provided. The wheel set is supported from each journal by two compensating V-blocks which can be moved vertically.

Each boring spindle is independently driven by its own motor through a large worm and wheel running in

oil. A speed gear box giving two changes of speed is interposed between the motor and the boring spindle. Power for the traverse of each head is taken from this gear box.

The machine can be furnished with either d.c. or a.c. motors. With direct current, two 5-hp. shunt wound motors are provided with two speeds of 650 and 1,300 r.p.m. Each motor is equipped with an automatic controller with push-button stations. With alternating current, two 5-hp. squirrel cage induction motors are used. The motors operate at 1,150 r.p.m. and the spindle speeds of 10 and 21 r.p.m. are secured through the use of the gear box. An automatic starter and compensator with push-button stations is also provided.

Crankpins up to 12 in. in diam. and 24 in. in length may be turned. The swing over the bed is 99¼ in. The boring bar and headstock can be traversed each about 5 ft.

—120—

Lathe, Journal-Turning, 90-In., "Niles"

Niles-Bement-Pond Co., 111 *Broadway, New York, N.Y.* [Vol.64,p.919.]

The 90-in. journal-turning lathe, illustrated, was designed primarily for turning and burnishing inside and outside journals, but it can

also be arranged for quartering and crankpin turning on locomotive wheels by means of special attachments.

A counterweight device has been placed in the faceplate to balance the counterweight on the driving wheels. It is a single casting and has a single adjustment for different size wheel sets. The headstock and tailstock are both provided with power traverse along the bed by means of separate 5-hp. motors driving a revolving screw in the bed.

For direct current, the machine is driven by a 15-hp., 220-volt motor of 3 to 1 speed variation. An automatic controller and a push-button station are provided. For alternating current, the machine is driven by a 15-hp., 220-volt, 3-phase, 60-cycle constant-speed motor with a compensator. The swing over the bed of the machine is 90 in. The maximum distance between centers is 13 ft. The faceplate is 72 in. in diameter. The carriages are designed to turn journals up to 22½ in. in length simultaneously, but not less than 6 in. in diam. Hub liners can be faced up to 24 in. in diameter.

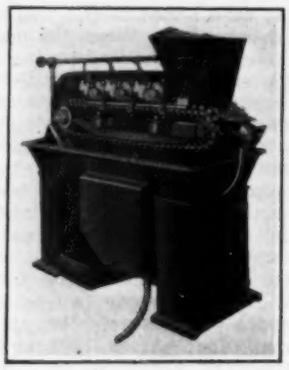
—121—

Slotting Machine, Nut, "Duplex"

Pellow Machine Co., 6527 *Epworth Blvd., Detroit, Mich.* [Vol.64,p.1004.]

The "Duplex" production nut-slotting machine is designed for slotting castle-nuts ranging from 1/16 to 1½ inches.

The machine has two nut carrier lines, one on each



side. These carriers are endless chains, each containing 63 units. The carrier passes over a 90-deg. angle way, and each unit is held in position under the saw independently of the other units.

Three saws are provided in position above each carrier. When the nut passes the first saw, the collet is turned in its socket one-sixth of a revolution, and after the second saw completes its cut the collet is again indexed. At the end of the carrier travel, the nuts automatically drop into a chute. A burring device is located behind each saw, to remove the burrs as the nut passes.

The saws, which are 4 in. in diam., have a speed of 200 r.p.m., and the nut carrier travels at a constant speed of 32 in. per minute. The machine is furnished with motor drive.

Other Machines

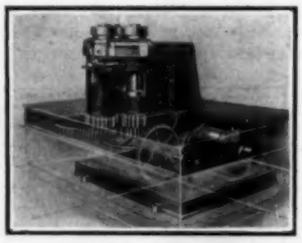
—122—

Bending Roll, Horizontal, No. 1

Buffalo Forge Co., 448 *Broadway, Buffalo, N. Y.* [Vol.64,p.378.]

The rolls on the No. 1 horizontal bending machine are arranged vertically so that the material worked upon is in a horizontal plane. The machine is mounted on a cast-iron baseplate at the bottom of a pit 16½ in. deep, 73 in. long and 64 in. wide. Ten-inch channel irons, placed on the floor, support a ⅜-in. checkered steel plate which surrounds the machine. This plate or platform is 10 in. above the floor level, while the rolls are 36 in. above the level.

All gearing is set in the pit. A 10-hp. General Electric reversing motor is used for the drive. It has a pinion keyed to the motor shaft. The driving gear is



mounted on the main drive shaft of the machine. Lubrication of the motor and main drive-shaft bearings is taken care of by means of ring oilers. All other parts of the machine are fitted with Alemite connections. The hollow upright column at the back of the machine has shelves for storing additional rolls.

The maximum adjustment of the rolls is 1¾ in. to secure circles ranging from a diameter of 13½ in. to any larger desired. The adjustment is made by means of a capstan wheel at the front of the machine.

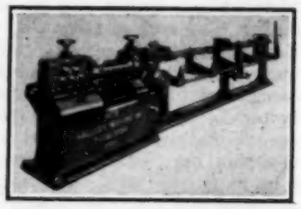
—123—

Wire-Straightening and Cutting-Off Machine, Rotary, Automatic

Hallden Machine Co., Thomaston, Conn. [Vol.64,p.578.]

This machine is intended for straightening coil wire, for cutting it into pieces of a predetermined length, and for then depositing the pieces of a predetermined length, and for then depositing the pieces on a forked table. The machine will handle wire of various composition from brass to alloy and high-carbon steel.

The unit consists of a preliminary seven-roll straightener, a rotary straightener,



two pairs of fibre pinch rolls and a flying shear. The rotary straightener is equipped with five pairs of bell-shaped crimping dies. The preliminary seven-roll straightener takes the first bend out of the wire and is designed to carry the wire through the rotary straightener at a uniform speed without slippage. The two pairs of fiber pinch rolls between the straightener and the shear also help to pull the wire through the rotary straightener.

All fast-running parts are mounted on roller bearings equipped with the Alemite lubricating system. The machine is made in four sizes. The No. 0 is intended for handling wire from 1/16 to 1/32 in. in diameter, the No. 1 from ¼ to ¼ in. in diameter, the No. 2 from ¼ to ⅜ in. in diameter, and the No. 3 from ⅜ to ½ in. in diameter. Motors of 5, 7½, 10 and 15 hp. are used, respectively, for the four machines. They operate at 1,800 r.p.m. and are direct connected. The weight of the machines is 3,500, 5,000, 6,500 and 9,000 lb. respectively.

—124—

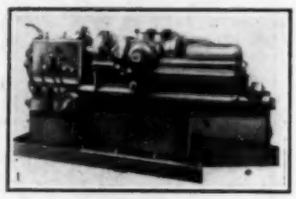
Automatics, Modified for Brake Drums

Potter & Johnston Machine Co., Pawtucket, R. I. [Vol. 64,p.843.]

Modifications in its Nos. 6D and 6A automatics for finishing Ford brake drums have been made by this com-

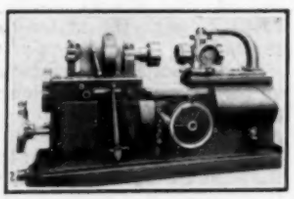
pany. In both cases the tools are revolved and the work is indexed in the turret heads instead of the usual reverse practice. Magnetic chucks, made by the O. S. Walker Co., Worcester, Mass., are used.

The operator sits above the machine and a conveyor, and



places each drum on the horizontal face of the chuck in the top position of the turret. Two pins in the face of the chuck engage two of the rivet holes in the brake drum and center it. The magnetizing current is automatically thrown on when the chuck has been indexed to the 45-deg. position.

Revolving tools face the end of the drum, flange and chamfer it both inside and outside. While the cut is being taken the turret slide is locked in place. The turret slide travels 3½ in. and a



spring-actuated bumper is used to absorb the shock of deceleration from the quick initial advance to the slow cutting advance.

The piece is ejected by means of stripper pins when the magnetic chuck is in its lowest position. The indexing is governed by a Geneva stop.

The revolving cutter used in the modified 6A manufacturing automatic is of the inserted-tool type. As in the case of the 6D machine the brake drums are located on the faces of the magnetic chucks by means of pins that engage the rivet holes.

—125—

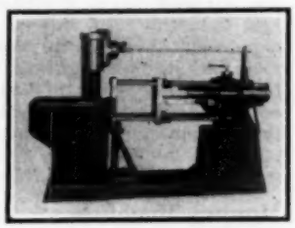
Die-Casting Machine, Improved

Simplex Casting Machine Co., 21152 12*th St., Brightmoor, Detroit, Mich.* [Vol.64, p.298.]

The improved semi-automatic machine for die-casting, illustrated, is air driven and uses oil, gas or electricity as a means for heating the melting pot. The machine operates on an air-line pressure of from 25 to 100 lb. per sq.in., exerting a proportionate pressure of from 500 to 2,000 lb. per sq.in. upon the molten metal.

The machine is designed for one-man operation and is controlled by means of two levers, one of which governs the carriage mechanism, while the other governs the flow of molten metal into the dies. An automatic ejector removes the castings from the dies. A positive locking mechanism prevents the dies from opening when pressure is on the metal. The dies are water cooled to increase their production.

The metal pot can be completely drained when neces-



sary. The water-cooled nozzle is of alloy and will not anneal under 2,000 deg. F. It is claimed that the nozzle will not warp, score or crack under repeated heating and cooling.

The capacity of the pot is 500 lb. of white brass. The air required is 100 cu.ft. per hr. on castings up to 7½ lb. in weight. The floor space required is 86x26 in. and the height of the machine is 70 in. It weighs approximately 5,000 pounds.

—126—

Flexible Power Unit, No. 112

Sirianni & Trumbettas Manufacturing Co., Carbondale, Pa. [Vol.64, p.694.]

The flexible power unit, No. 112, consists of a motor mounted on a special base, a

flexible shaft, a grinding wheel and a buffing wheel. Various tools may be attached, including a drill. The flexible shaft is connected to the motor by means of a flexible coupling.

The core of the flexible shaft is ½ in. in diam. and is wound from hardened steel wire. The sheath is made of spiral-wound zinc-plated steel with an inner lining of flat coil steel that gives a smooth bearing surface to the revolving core. The shaft is fitted at the end with a ball-bearing handpiece.

Either a ¼- or a ½-hp. motor can be supplied with the No. 112 unit. This size will drive an 8-in. grinding wheel or a ½-in. drill in steel.

—127—

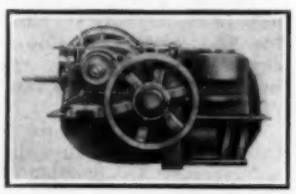
Forging Machine, High-Duty

National Machinery Co., Tiffin, Ohio. [Vol.64, p.257.]

Improvements in this company's line of forging machines have increased their capacity, weight and speed of operation for high-duty service. The essential features of the earlier models have been retained.

The bed frames have been increased in depth and weight and are constructed in the form of a heavy C-clamp to secure rigidity and to prevent the springing open of the bed frame. It is claimed that the construction prevents swollen shanks and excessive fins on the forgings and practically eliminates the necessity for back stops. It is said also to make unnecessary the use of tie rods.

The illustration shows a view of the flywheel side of the machine. The compactness of design is made possible by means of the adoption of the over-arm type heading slide which has only part of



its necessary length at the customary location ahead of the crankshaft. This over-arm is an extended bearing which serves to increase the accuracy of the slide alignment. By maintaining uniformity of grip slide alignment, the grip dies can be made to grip the work through its entire length.

An increase in the depth of die space has been made entirely below a center line passing through the crankshaft. This construction makes possible the use of higher dies than previously without giving the heading slide a tendency to rise out of its bearings. The machines are equipped with the usual suspended-type heading and grip slide bearings designed by the company. The bearing surfaces are placed above the path of scale and water and they have the wedge adjustment at the side of the slides.

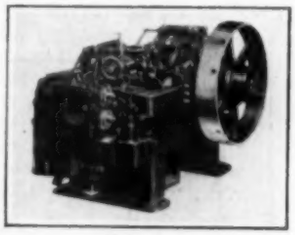
The machines are built in sizes of 2, 3, 4, 5 and 7½ in. and are supplied for either belt or direct-geared motor drive. A friction-slip flywheel is supplied as a safeguard to the motor.

—128—

Heading Machines, Bolt, Semi-Hot, Automatic-Feed, ⅜- and ⅝-Inch

National Machinery Co., Tiffin, Ohio. [Vol.64, p.841.]

A ⅜-in. and a ⅝-in. semi-hot rivet and bolt heading machine with an automatic feed are being marketed. The



⅝-in. machine makes a variety of single-blow work up to ⅝ in. in diam. and 4½ in. in length. The ⅜-in. machine handles work up to ⅜ in. in diam. and 7 in. in length. The illustration shows the ⅝-in. machine.

In both machines the bed frame is short and massive. The heading slide has a suspended over-arm that gives it a bearing in back of the crank. The bolster plate is designed so that the heading tool is always supported firmly. The plate is screw-controlled in all directions to permit rapid and accurate alignment of the heading tool with respect to the grip dies.

The feed mechanism is set so that the material is sheared at an angle. An adjustment is provided on the machine to vary the gripping time to suit various classes of work. If a sticker gets in between the dies an automatic trip causes the feed rolls to separate and stop feeding. A patented ejector pushes the work from the dies and allows it to drop free. All bearings in the machine are automatically lubricated. The ⅝-in. machine has a speed range from 150 to 200 r.p.m., while the ⅜-in. machine has a speed range of from 120 to 150 rev. per minute.

— 129 —

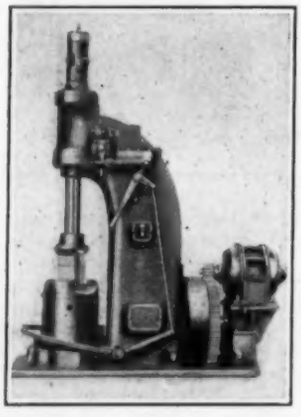
Hammer, Forging, Pneumatic, "Bates"

Williams, White & Co., Moline, Ill. [Vol.64,p.732.]

The "Bates" pneumatic forging hammer, illustrated, is designed to deliver full power on the first blow as well as full speed on light blows. It can be operated by means of a direct-connected motor or by belt.

The frame and the base of the hammer are cast in one piece. The anvil is a separate casting of gray iron. The bolster or cap for the lower die is made from steel and keyed in a diagonal position to permit the working of long bars in either direction in the dies. A mat is provided on the hammer to bear on a cushion sub-foundation and to absorb the force of the blows.

The ram consists of a solid bar that is of the same size over its entire length. The



two sides of the ram are flattened at the upper end where they pass through the cylinder head so as to prevent any rotation of the dies.

When the treadle is released the ram lifts to the upper end of the stroke and is held suspended so long as the compressor continues running in the idling position. The downward stroke of the ram is produced by means of the compressed air injected into the upper end of the ram cylinder and the force of the blow is augmented by the vacuum created underneath the ram as well as by the compression produced in the top of the compression chamber by the previous upward stroke of the ram.

The hammer is built in a line of sizes to work stock 2½, 3½, 4½, 6, 7 and 8 in. square, respectively. The weights are 4,000, 6,000, 9,000, 17,000, 28,000, and 32,000 lb. respectively.

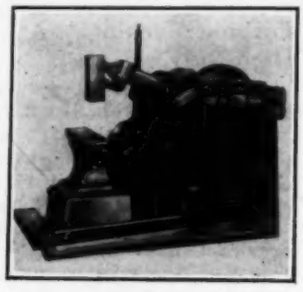
— 130 —

Hammer, Smithing

Chambersburg Engineering Co., Chambersburg, Pa. [Vol.64,p.880.]

The Smithing hammer shown is for service in forge and repair shops.

The intensity of the blow can be regulated from a light tap to heavy forging blows. The head of the hammer is mounted so that its face is always parallel to the anvil.



The same pedal controlling the blow also controls a power traverse for moving the hammer so that it can strike on any part of the surface of the anvil.

The machine can be operated from a belt or individual 2½-hp. motor mounted on the frame. It will make a maximum of 218 blows per min. The weight of the hammer head is 50 pounds.

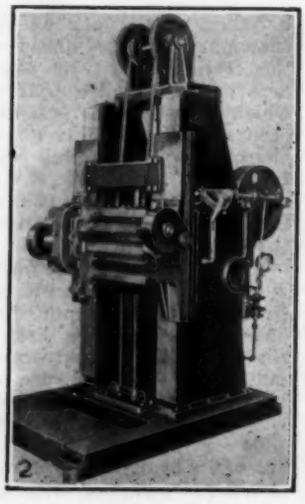
— 131 —

Lapping and Boring Machines, Cylinder

Moline Tool Co., Moline, Ill. [Vol.64,p.35.]

The No. 8 lapping machine has been improved and the No. 10-D cylinder boring machine illustrated, has been provided with an automatic "Oilgear" feed.

The lapping machine has a table mounted on an adjustable screw to provide for



work of various heights and has a sliding rail with automatic feed. The spindles are driven through a horizontal spiral and spiral gears. They operate against ball-thrust bearings. The spindle heads can be located in any position. Six can be carried on the rail. The coolant is pumped to the work and is then drained into a settling tank. Oil and grease cups are provided.

The boring machine is shown in a stripped condition so that the "Oilgear" feed mechanism can be seen. The hydraulic cylinder stands between the two vertical housings. The piston is connected directly to one crossarm of the rail assembly. The flow of oil to the piston can be regulated so that the rail will descend rapidly until the spindles reach the piece, and then the feed will be at a rate suitable for the work. Counterbalance weights carry the rail. A gage is provided so that the pressure applied to the arm can be observed.

— 132 —

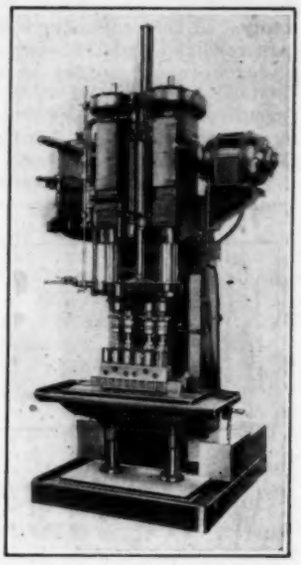
Honing Machines, Hydraulically-Reciprocated, Types Nos. 214 and 212

Barnes Drill Co., 830 Chestnut St., Rockford, Ill. [Vol. 64,p.837.]

Two honing machines have been developed by this company for automotive production. The type No. 214 multiple-spindle machine for engine blocks is illustrated, but the type No. 212 single-spindle machine is not shown.

The multiple-spindle machine can have a stroke up to 16 in. There are two driving spindles which run in cylindrical guides 5 in. in diam. They are driven by means of helical self-oiling steel crown gears. On the bottom end of the reciprocating guides is attached the multiple head, which can have from two to eight spindles as desired. The hydraulic cylinder for reciprocating the spindles is mounted between the spindle housings, and its piston is attached to the auxiliary head. An air cylinder counterbalance is used, which operates directly on the main air line.

All power shafts on the machine are mounted on radial ball bearings. The spur gears have helical teeth and are made from heat-treated steel. A forced-feed lubrication system supplies oil to the ball bearings and sliding surfaces. An air-operated-table can be supplied. The air cylinder al-



lows the table to be lowered about 9 inches.

The height of the multiple-spindle machine, overall, is 11 ft. and 7 in. The maximum distance from the top of the table to the nose of the multiple spindle is 41 in., while the minimum distance is 3½ in. The machine requires a 20-hp. motor operating at 1,200 r.p.m. The floor space required is 61x76½ in., and the weight is about 7,840 lb. with the motor and starter.

The principles of operation of the single-spindle machine are the same as those for the multiple-spindle machine. A ball-bearing coupling connects the spindle to the piston of the hydraulic reciprocating mechanism. The hydraulic cylinder is superimposed directly over the spindle. The arrangement permits the regulation of the stroke to the desired length up to 16 inches.

The height over all of the single-spindle machine is 11 ft. and 10 in. The maximum distance from the top of the table to the nose of the spindle for a No. 4 Morse taper is 35 in. while the minimum distance is 8 in. The machine requires a 5-hp. motor having a speed of 1,200 r.p.m. The floor space required is 57x53 in., and the weight is about 3,400 lb. with the motor and starter.

— 133 —

Buffing Machine, Auto-Body

N. A. Strand & Co., 5001 North Lincoln St., Chicago, Ill. [Vol.64,p.176.]

The tool illustrated is a flexible shaft machine for buffing auto bodies. The shafting is driven from a

1-hp. electric motor that is mounted on a four-wheel truck and swivel base. A belt on a three-speed cone pulley is used to rotate the shaft.

The equipment operates a Strand "multipad" buffing wheel which was previously described on page 482, Vol. 62, of the *American Machinist*. The buffing wheel is 8 in. in diam. and 3 in. wide.

It is fitted with small felt pads to bring the final finish of the body to a high lustre. The wheel is not intended for removing the so-called "orange peel effect" from lacquered finishes.

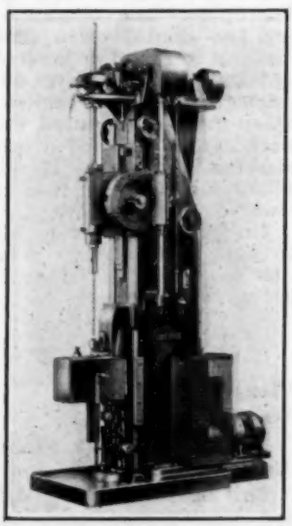
— 134 —

Burnishing Machine, No. 1

Defiance Machine Works, Defiance, Oho. [Vol.64,p.535.]

The No. 1 burnishing machine illustrated is for use on the bronze-bushed holes in steering knuckles and other similar parts. A single-pulley drive from the rear of the machine can be used, or a direct motor drive can be had. A 3-hp., 1,150-r.p.m. motor is recommended.

The carriage which supports the spindle, on a vertical slide, is actuated by means of a wormwheel. A hand lever controls the right- and left-hand friction drive which has a gear and spline-shaft mechanism. The feed can be adjusted for continuous motion of the spindle and of the saddle up and down, or it can be adjusted one complete cycle.



The main spindle of the machine is 1⅝ in. in diam. and 2¼ in. in diam. at the nose. The end is bored for a No. 3 Morse taper. The spindle speed is 290 r.p.m. and its feed is 54 in. per min. The maximum spindle travel is 18 in. The distance from the center of the spindle to the face of the column is 8½ inches.

The coolant tank is mounted on the lower saddle on the front side of the machine. It is raised and lowered by means of an air cylinder operating under a pressure ranging from 60 to 100 lb. When the coolant tank is raised the work to be burnished is immersed in the coolant while the operation takes place.

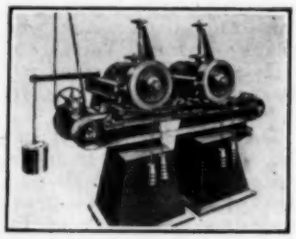
The floor space occupied by the machine is 32x68 in. and its weight is 4,250 lb. net.

— 135 —

Polishing Machine, Automatic

Divine Brothers Co., Utica, N. Y. [Vol.64,p.925.]

The polishing machine shown in the accompanying illustration has been placed



on the market for the automatic polishing of flat stock and flat surfaces.

The material to be polished is placed on a feed belt that carries the work under a series of polishing wheels where the process is completed mechanically. The contact between the work and the wheels is maintained by a micrometer adjustment. The wheels are both weight and spring balanced to secure delicacy of pressure.

Each polishing wheel is driven by an independent direct-drive motor. The machine is built in individual units, each carrying a wheel. They can be arranged in a battery to suit the requirements of the work.

A variable-speed transmission provides for feed-belt speeds of from 5 to 25 ft. per min. The belts will accommodate pieces from thin sheets to several inches in thickness. The machine is built with various widths of feed to take pieces up to 20 or more inches wide.

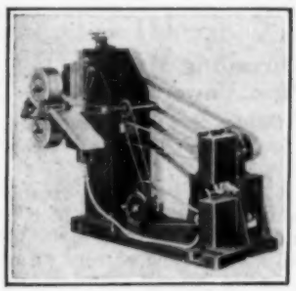
— 136 —

Polishing Machine, Strip, Automatic

Mitchell Engineering Co., Springfield, Ohio. [Vol.64,p. 1002.]

The machine illustrated is for automatically polishing both sides of strip metal or narrow sheets simultaneously.

It is provided with two wheelspindles, one above the



other, which can be adjusted vertically. Each is driven by a separate motor. The lower motor also furnishes power for operating the strip-feed rollers, while the upper motor also operates an oscillating mechanism for moving the upper and lower wheelspindles back and forth sidewise. To permit these movements, both wheelspindles are mounted on horizontal slides, which are in turn carried on vertical slides.

The weight of the machine complete with motors, starters and wheels is approximately 3,100 pounds.

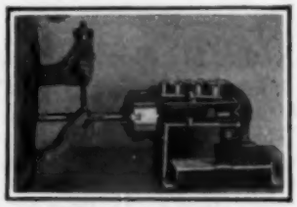
— 137 —

Reaming Machine, Piston and Connecting-Rod, "Reamo"

Van Norman Machine Tool Co., Springfield, Mass. [Vol. 64,p.1004.]

The bench type motor-driven reaming machine illustrated is designed for finishing piston and connecting-rod bushings, but it can be adapted also to general machine shop use in place of hand-reaming methods.

A ¼-hp. motor drives the unit and operates on either 110- or 220-volt, single-phase,



60-cycle alternating current. The motor can be supplied also for 25- and 40-cycle single-phase current. The motor drives a worm and wheel through intermediate spur gears. The spur gears are exposed, but the worm and wheel run in a bath of oil. The final spindle speed is 30 r.p.m. A chuck is provided that is adjustable to hold reamers ranging from ¼ to 1½ in. in diam. for finishing bronze bushings.

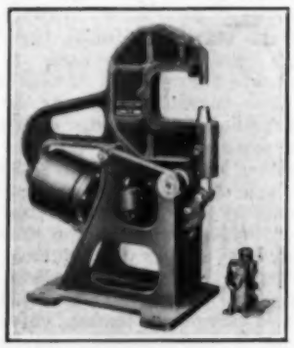
— 138 —

Riveting Machine,

Hanna Engineering Works, Chicago, Ill. [Vol.64,p.617.]

An improved riveting machine made by this company permits inserting rivets from above and driving from below.

The mechanism consists of a combination of a simple lever and toggle. The actuating force is supplied through a pneumatic cylinder and piston. The lever and link are so proportioned that there is a wide range of uniform pressure on the die stroke.



The die approaches the work rapidly and then decreases in speed as it enters the uniform pressure zone. Where the work is lightest the speed is greatest, and as the rivet head forms the speed drops, the pressure increases to a maximum and is held there for several inches of piston travel. Ordinary variations in rivet length and plate thicknesses are automatically compensated without any screw adjustment on the die.

The riveter is made in sizes capable of driving ¼- to ½-in. rivets hot, and ⅛- to ⅝-in. rivets cold. It can also be used for punching.

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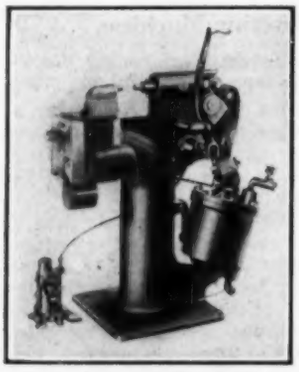
Riveting Machine, Turret

Hanna Engineering Works, Chicago, Ill. [Vol.64,p.838.]

The turret riveting machine, illustrated, is for use in cold-riveting automobile chassis frames. It has a rotating turret head that carries four horns for successive indexing into line with the movable die mounted on the plunger or ram. These noses enter the chassis frame, and they are shaped to conform to the open space in the frame adjacent to the various rivets.

The turret head is mounted on a live spindle and is locked by means of an index pin. The index pin movement is controlled by a double-acting air cylinder, supplemented by the hand



crank by means of which the head is actually indexed. The riveting mechanism proper is the standard Hanna type. Air pressure is used to actuate the piston.

The turret riveter can be furnished with a stationary or a swivel base. With the latter, the riveter can be locked in two or more positions by means of a vertical pin in the frame column that engages holes in the base. The movement of the riveting mechanism is controlled by a standard Hanna valve that is foot operated. When the riveting die is all the way back, the valve is brought to a neutral position. The air intake is shut off on the return stroke and all air is excluded from the riveter while it is idle. The riveter can be operated at fifty cycles per minute. The machine occupies a floor space of 30x40 in. and is 45 in. in height.

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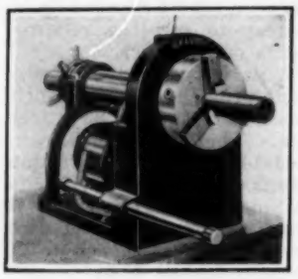
Power Drive, No. 44, "Beaver"

Borden Co., Warren, Ohio, [Vol.64,p.334.]

The No. 44 "Beaver" power drive is intended primarily



for pipe cutting and threading, but can be used for driving other hand tools. The unit consists of a chuck driven through gearing from an electric motor. The motor is ½-hp., 110- to 220-volt, a.c., 60-cycle, single-phase. Motors with other specifications can be supplied. The unit is designed to cut and thread pipe of from ¼ to 6 inches.

The net weight of the drive is 230 pounds.

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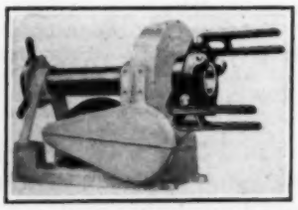
Threading Machine, Pipe, Power, Portable

Oster Manufacturing Co., Cleveland, Ohio. [Vol.64,p. 419.]

The light-weight portable power-drive pipe threader is intended for driving die stocks and pipe cutters up to 2 in. in diam., but with an auxiliary drive shaft, geared die stocks and cutters for up to 6 in. can be accommodated. The machine can also be used to screw up fittings, since a pipe wrench can be held in its driving arms. The pipe is held stationary by means of a three-jawed self-centering chuck, and the pipe tools are turned by means of driving arms. Self-centering universal guides in the rear of the machine facilitate the



centering of long lengths of pipe.

The driving power is furnished from a ½-hp. universal reversing motor that automatically speeds up on the smaller sizes of pipe, and holds the necessary speed on the larger sizes. The motor can be operated on a lamp circuit of 110 or 115 volts, d.c., or 25- to 60-cycle a.c. current. The machine stands 18½ in. high, 14½ in. wide, and 30½ in. long. Its weight is 150 pounds.

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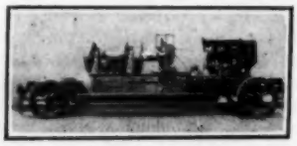
Threading Machine, Pipe, Portable

Landis Machine Co., Waynesboro, Pa. [Vol.64,p.689.]

The portable pipe-threading machine consists of the Landis 8-in. pipe-threading and cutting machine, and a chaser grinder mounted on a trailer built by the Highway Trailer Company.

The pipe-threading machine was previously described on page 1066, Vol. 63, of the *American Machinist.* It is



equipped with chasers for cutting the various diameters, pitches and tapers on pipe and casings. The chaser grinder has a small tool rest and a plain wheel.

The grinder and threading machines are driven by a Fordson tractor mounted on the front part of the trailer.

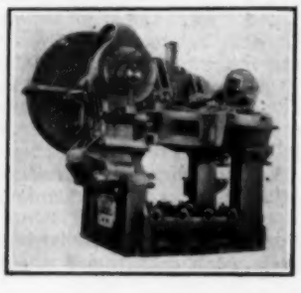
—143—

Shear, Bloom, Heavy-Duty

The United Engineering and Foundry Co., Pittsburgh, Pa. [Vol.64,p.653.]

The shear illustrated is driven by a 250-hp. motor and operates at a speed of twelve cuts per min. The maximum pressure exerted at the knives is 1,800,000 lb., and it is possible to cut a hot slab 6x40 in. in section. By means of special knives and knife-blocks the machine will shear hot blanks for 15-, 18- and 24-in. I-beams.

The knife-head has a special spring balance to insure uniform pressure at all positions of the head. The stroke is 18-in. The front of the shear below the top knife-block is flush with the bottom knife. By means of this design the front of the shear is left entirely clear so that the sheared material can be handled with ease. The housing weighs 65,000 pounds.



—144—

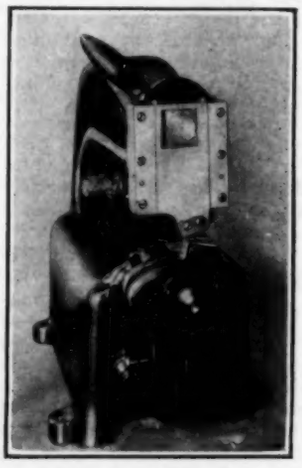
Cutter, Inside, Model O, "Unishear"

Unishear Co., 170 *Fifth Ave., New York, N. Y.* [Vol. 64,p.848.]

The model O deep-throat shear has been developed particularly for use where inside cutting is necessary. Holes or shapes can be cut within a sheet of metal without previously drilling a hole to start the cut.

Cold-rolled steel, including 14-gage stock, and 12-gage copper can be handled. Fiber ¼ in. thick and rubber up to ½ in. thick can be cut. The material is drawn through the blade by hand, and can be moved as desired to follow the lines of the design. In 16-gage metal the average speed capacity is 15 ft. per min. The throat of the machine is 15 in. deep as standard, but machines can be made to order with throats up to 36 in. deep.

The motor is mounted in an inverted position in the base



of the machine and connected to the reduction gears by means of a flexible coupling. The upper blade is stationary and carried on a slide that can be raised or lowered by means of a hand lever operating through an eccentric. When the slide is raised, the work can be inserted in the machine between the blades. The upper blade can then be lowered on to the work.

The space required is 24x 10 in. and the height is 20 in. The weight of the shear is 195 pounds.

—145—

Cleaning Machine, Safety

Demco, Inc., Baltimore, Md. [Vol.64,p.618.]

The machine illustrated is for cleaning small parts and

tools with gasoline or any other inflammable cleansing fluid.

The device consists of a bowl in which the cleansing is performed, a reservoir for the fluid and a pump. A single lever lifts the cover and brings the pump into operation. The pump raises the fluid from the storage chamber in the base of the bowl and ejects it forcibly through a nozzle. The article to be cleaned is held in the operator's hand.

The bowl is 13 in. in diam. and contains a fine-mesh strainer at the bottom to remove the dirt and chips from the fluid before they fall into the reservoir underneath.

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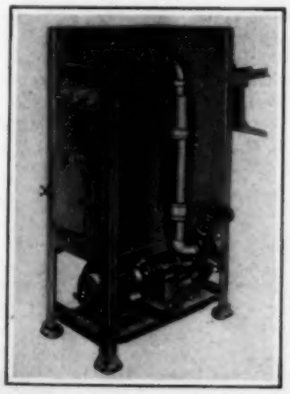
Washing Machine, Parts, Improved, "Autosan"

Colt's Patent Firearms Manufacturing Co., Hartford, Conn. [Vol.64,p.1000.]

An improved "Autosan" parts washing machine especially adapted for use in connection with the Blanchard automatic grinding machine or machine of similar nature has been placed on the market.

The parts to be washed are pushed through a skidway by the following pieces ejected from the machine with which it is used. A double spray,



one above and one below the work, delivers approximately 100 gal. per min. of the washing compound under a pressure of 7 lb. per square inch.

The spray nozzles are made entirely of brass and are easily removable. The washing compound is circulated by a special Colt pump, directly connected with a standard electric motor and running on ball bearings. Electricity is used to heat the washing compound, the medium for heating being a General Electric universal immersed unit. A fine-meshed screen of brass wire strains the liquid after it has passed through the spray nozzles and before it is returned to the suction side of the pump.

The floor space occupied is 20x28 in. and it weighs approximately 575 lb. A 1-hp. motor drives the pump.,

— 147 —

Electrode, Copper-Tungsten

Elkon Works, Inc., of P. R. Mallory & Co., Weehawken, N. J. [Vol.64,p.458.]

The "Elkonite" copper-tungsten electrodes developed by the General Electric Co., are being made by the above company. They are intended especially for use in resistance or spot welding operations in place of the hard copper electrodes ordinarily used that have to be frequently redressed and that tend to become annealed under the heat of the welding operation.

The alloy used in "Elkonite" electrodes has a Brinell hardness of 225. Its compressive strength is 208,000 lb. per sq.in. and its tensile strength is 56,350 lb. per sq.in. It is claimed that the material will not anneal at red heat. Its chief value at present is for uses such as hot-upsetting rivets electrically, facings for clamps for rod welding, split dies for welding steel spokes to both the rims and hubs of steel wheels, and similar processes. In welding, copper-tungsten inserts are used and the remainder of the die is of copper.

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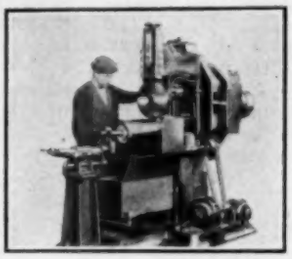
Welding Machines, Resistance

General Electric Co., Schenectady, N.Y. [Vol.64,p.576.]

Two resistance welding machines have been placed on the market. One is for straight-seam work, while the other, illustrated, is for circular seams. The machines consist fundamentally of a frame for holding the work, a transformer for supplying current to the electrodes, movable electrode wheels, and the necessary controls. They were particularly designed for welding the seams of light metal containers such as ice cream cans, drums, and similar articles and are suitable only for making lap joints with relatively thin metal. Among the advantages claimed for the machines are the absence of fumes and open arcs, and the fact that the operator requires no special welding training.



The welding speed obtainable with the welding machines varies from approximately 20 in. per min. to 100 in. per minute, depending on the nature and the thickness of the material to be welded. The machines will accommodate material up to ¼ in. in thickness.

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Welding Machine, Production

Eisler Engineering Co., Inc., 750 South Thirteenth St., Newark, N. J. [Vol.64,p. 732.]

The welding machine, illustrated, is designed especially for sheet-metal work, wire welding, jewelry and metal novelties. It is said to weld wire as fine as 0.0005 in. in diameter.

The machine connects directly to a 60-cycle circuit of either 110 or 220 volts, and has a step down transformer.

The breaker points make contact through the action of a treadle, the upper electrode moving down to meet the stationary lower one. Different types of electrodes are used according to the class of work being done.

Measuring, Gaging and Testing Equipment

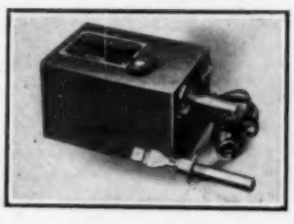
— 150 —

"Davey" Vibrometer

E. M. Sawtelle, 11 Broadway, New York, N. Y. [Vol. 64,p.175.]

The instrument illustrated has been designed by Peter Davey for the measurement of vibration. The identification of critical speeds is another work for which the vibrometer is intended. It will show the direction of maximum vibration whether axial, transverse or vertical.

The vibrometer consists essentially of a box in which is fitted the vibration indicating unit which is made up of a tube that houses a long pivoted lever, operating against a spring. The indicating end of the lever mounts a white surface with a black hairline engraved on it. The tubular housing carries, at this end, a fine scale for showing the distance of vibration of the hairline. The movement is viewed through a lens.



In operating the instrument, the box may be held in the hand, or it can be mounted on some object that is immune from the vibration to be measured. The pin on the end of the lever is held in contact with the vibrating part.

The vibrometer can be combined with the vibroscope, previously described on page 834, Vol. 63, of the *American Machinist*. With this combination the vibrations can be completely analyzed as to frequency.

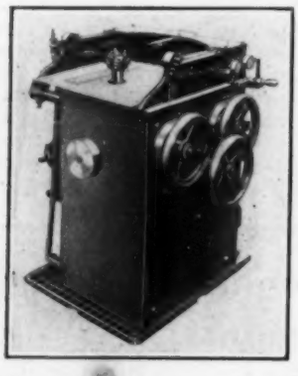
— 151 —

Balancing Machine, Vertical, No. 3

Tinius Olsen Testing Machine Co., 500 No. 12th St., Philadelphia, Pa. [Vol.64,p. 417.]

The No. 3 balancing machine illustrated is for balancing flywheels, pulleys, clutch parts, disks and bodies that are easily handled on a vertical spindle. An unbalance is created in the machine to counteract the unbalance in the body being tested and when this artificial unbalance is of the same magnitude as the unbalance in the body being tested and when the two planes of unbalance in the test piece and the machine are of opposite directions, the whole unit comes to rest. The amount of the artificial unbalance is registered direct on dials on the machine.

The No. 3 balancing machine will register both static and dynamic unbalance, to-



gether with the angle of unbalance and it will also indicate the axial position of the static unbalance, and will show whether a dynamic couple exists in the body tested before the reading is taken.

The amount of static unbalance is registered on the outer edge of the unbalance dial in ounce-inches for the English measurements, and in kilogram-centimeters for the metric system. This represents the weight times the radius. The register of the machine divided by the radius at which the corrections are to be made is equal to the weight of the material to be removed in order to correct the unbalance.

The existence of a dynamic couple is indicated when it is found impossible to get the vibration to cease at the first or dynamic setting of the machine. In this case the spindle can be set at the point where the least vibration exists, which is the best axial location for correcting the static unbalance. The readings can then be taken for dynamic unbalance in the same way as for static unbalance.

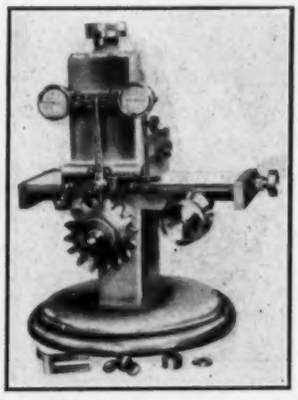
— 152 —

Testing Machine, Tooth-Form, "National-Cleveland"

National Tool Co., Cleveland, Ohio. [Vol.64,p.495.]

The "National - Cleveland" tester illustrated is for checking the accuracy of both the tooth spacing and the tooth profile of an involute gear shaper cutter or gear, which is mounted on the spindle of the machine.

A contact point on the end of a lever with a 10 to 1 multiplication touches the



tooth to be measured, while the other end is placed between two indicators that measure its movement. The pivot point of the lever is mounted on a slide that is actuated by a steel tape on a pulley mounted on the rear end of the gear-carrying spindle.

The head carrying the indicators can be adjusted vertically to take gears or cutters of different diameters. Micrometer graduations are provided for all movements. The machine is built in different sizes to measure gear-shaper cutters of 3 or 4 in. in diam. and in two sizes for Sykes herringbone cutters, the largest accommodating gears up to 12 in. in diameter.

— 153 —

Testing Fixture, Cutter

Brown & Sharpe Manufacturing Co., Providence, R. I., [Vol.64,p.843.]

The cutter testing fixture illustrated is being marketed for use in testing form cutters and hobs. All sizes of cutters up to 10 in. in diam. are within the capacity of the fixture.

The cutter to be tested is mounted on a fixed stud, while the testing device is adjustable and slides in guides. The testing plate proper is carried on an adjustable vertical guide the position of which is indicated on a scale graduated in fiftieths of an inch. Cutters

whose faces are either radial or undercut and cutters with either straight or spiral gashes can be tested.

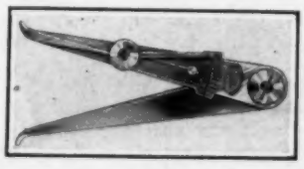
The dial indicator can be furnished to read to thousandths of an inch or hundredths of millimeters as desired. Five hardened and ground bushings are supplied with the fixture in the following sizes: ½, 1, 1¼, 1½, and 1¾ in. in diam. A collar is also provided for use when testing thin cutters.

— 154 —

Gage, Indicating, "Grove"

J. M. Waterston, 427 Woodward Ave., Detroit, Mich. [Vol.64,p.965.]

The "Grove" indicating gage is designed for the accurate measurement of internal surfaces. The tool is not a caliper, but is claimed to be a smooth-working indicator gage for accurate toolmaking work. Its measur-



ing capacity is from ¼ to 4 in. All parts are finished all over, and hardened where subject to wear.

— 155 —

Tachometer, Stationary, Type B, "Jagabi"

James G. Biddle, 1211-13 *Arch St., Philadelphia, Pa.* [Vol.64,p.337.]

The "Jagabi" type B stationary tachometer operates on the centrifugal principle and will rotate in either direction. The instrument is suitable for use on all types of rotating machinery where it can be belt connected.

The instrument is operated through a ¼-in. round belt by means of a pulley 2 in. in diam. The pulley is mounted on a shaft having ball bearings. Oil cups are provided for the shaft and for the tachometer mechanism. There are seven sizes in the line for ranges of from 150 to 8,000 rev. per minute.

— 156 —

Chronograph, "Master"

Mortimer J. Silberberg Co., Inc., 116 South Michigan Ave., Chicago, Ill. [Vol.64,p. 964.]

The improved model of the "Master" chronograph is intended for use in connec-

tion with industrial work, observations and investigations.

The instrument illustrated embodies larger pinions, stronger cam construction and larger jewel bearings than were used heretofore. The production figures have been carried out to include two minutes of observation instead of only one minute.

The time piece has fifteen jewels, with a chronographic indicator that operates in seconds and fifths of seconds. A small dial registers time measurements up to thirty minutes.

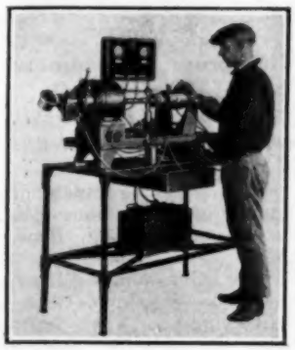
— 157 —

Test Bench, Electrical

Hobart Brothers Co., Canal Lock Square, Troy, Ohio. [Vol.64,p.218.]

The electrical test bench illustrated is for locating

troubles and for testing automatic starting motors, generators, or other electrical equipment. The test bench is equipped with a 1½-hp. Hobart reversible, variable-speed motor. A tachometer indicates the motor speed. The set has two-point and rotary spark gaps. A flexible coupling is used between the motor and the chuck. The



vise is designed to handle all sizes and types of generator and starting motors.

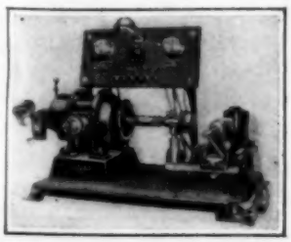
The switches are all of the inclosed tumbler type. Test sockets with external leads and a condenser with "in" and "out" plugs are provided. The ammeter has a range of 30-0-30 and 600-0-600, while the voltmeter has a 0-25 range. There is also a complete torque test fixture.

— 158 —

Test Bench, Electrical, Model 36

Joseph Weidenhoff, 4352-58 *West Roosevelt Road, Chicago, Ill.* [Vol.64,p.458.]

The model 36 electrical test bench illustrated is being marketed. The motor supplied with the unit is a variable speed one and can be operated up to 3,600 r.p.m. in either direction. It is manufactured by the General Electric Co. At 1,800 r.p.m. it develops 1¼ hp. A tachometer is directly connected to the motor shaft. An ignition breaker of the cam type, a standard breaker plate with tungsten contacts for testing coils and condensers, a condenser, and a rotary spark gap are provided. The unit to be tested is held in a vise



with 3-point suspension and is driven by means of a flexible coupling.

The slate panel is 21x9 in. in size. It is usually supplied with a voltmeter calibrated for 0-25 volts, with ammeters calibrated 30-0-30 and 300-0-300, with a cutout for 6 and 12 volts, and with a lamp for ground tests and illumination. The bench is 32½ in. long and 20 in. wide, and the unit is 24 in. high. It weighs 220 pounds.

— 159 —

Gage, Toolmakers'

Nehemiah W. Ordway, 2 *Congress St., Hartford, Conn.* [Vol.64,p.838.]

The toolmakers' gage, illustrated, has been brought out especially for the gaging of drill points being ground. It covers all sizes of drills up to 2¾ in. A 6-in. graduated scale is also supplied, and the

gage can be used as a square or as a taper gage in filing the clearance in dies. A miniature size handles small work.

— 160 —

Micrometer, Compression-Loss "White"

Leak Micrometer Corporation, 1068 *Mission St., San Francisco, Calif.* [Vol.64,p. 962.]

An instrument for measuring compression leaks in internal combustion engines is being marketed under the name of the "White" compression-loss micrometer. The principle of operation involves the measuring of the flow of air at a predetermined pressure through any leaks that may exist in a cylinder block assembly. The valve and the piston leakage can be measured independently. The instrument is connected to a source of air supply which is reduced by a valve to a constant pressure of 75 lb. per square inch.

The outlet hose is connected by means of a special

plug to the cylinder being tested and the air flowing through the leaks is passed through an orifice of known area. The drop in pressure is read on a gage.

To measure the valve leakage a quantity of heavy cylinder oil is placed on top of the piston to seal it against leakage. The piston leakage is determined by subtracting the valve leakage from the total. The presence of scores or other imperfections on the cylinder walls can be detected by taking readings at different positions of the piston. If the cylinder is perfect, all the readings will check.

— 161 —

Testing Machines, Hardness, Brinell, Production-Type, Nos. 1 and 2

Tinius Olsen Testing Machine Co., 500 *No. 12th St., Philadelphia, Pa.* [Vol.64,p. 457.]

Two sizes of production-type direct motor-driven, hydraulic Brinell hardness-testing machines, one of which is illustrated, have been placed on the market. The Brinell load of 3,000 kg. is applied and removed by means of a small knurled knob. The pressure can be

maintained as long as desired. The load is controlled automatically and adjustment is provided for calibration.

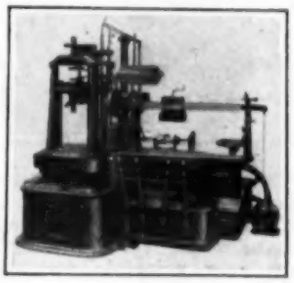
The machine is self-contained and is supplied with a fractional-horsepower motor to suit the requirements. The No. 1 machine has a gap of 4 in. and is suitable for parts up to 7 in. in diam. The height of the machine is 30 in. The width is 18 in. and its length is 24 in. The weight of this size is 300 lb. The No. 2 machine has a gap of 7½ in. and will accommodate parts up to 15 in. in diam. The height is 42 in. and the width is 20 in. and its length is 30 in. The weight of the No. 2 testing machine is 600 pounds.

— 162 —

Testing Machine, Universal, Automatic and Autographic

Tinius Olsen Testing Machine Co., 500 *North 12th St., Philadelphia, Pa.* [Vol.64,p. 652.]

The automatic and autographic testing machine shown in the illustration is intended for determining



the tensile, compression or transverse strength of materials.

The piece to be tested is clamped by means of two pairs of wedges, one above the column and one below the crosshead. The crosshead is drawn down or moved upwards by means of revolving nuts turning on three screws. The drive is through a gear box providing eight changes of speeds. The speeds are applicable in either direction by shifting the left-hand lever. The gears are mounted on ball bearings and are entirely inclosed. They run in a bath of oil. The machine is operated by means of a constant-speed motor and silent chain drive.

The load applied to the piece to be tested is balanced by the scale beam. The poise is moved farther along the beam by either hand or power drive. The speed can be regulated by means of a cone speed-change device. The poise is moved along the beam by the rotation of a horizontal screw parallel to

the scale. The machine can be fitted with special columns and extensions to the weighing table for handling long tension members or columns in compression, or long beams transversely.

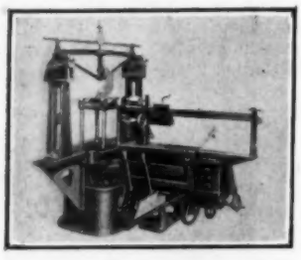
Five sizes are being manufactured to handle various loads. Their weights range from 3,000 to 13,250 lb., and their load capacities from 30,000 to 200,000 pounds.

— 163 —

Testing Machine, Brake-Beam

Tinius Olsen Testing Machine Co., 500 N. Twelfth St., Philadelphia, Pa. [Vol.64,p. 695.]

The brake-beam testing machine shown in the accompanying illustration is provided with a motor drive, and the power is transmitted through gearing and



shafts to the base of the machine. The crosshead is of the four-screw type and operates on the revolving-nut gear principle for applying the load.

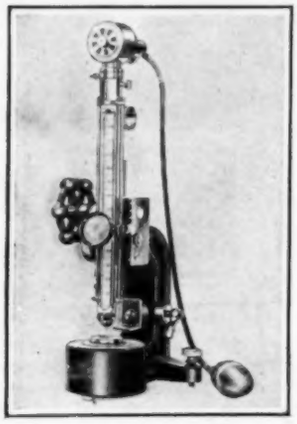
The load applied to the brake beam is balanced by means of the poise and scale beam to the right. The poise is moved along the beam by means of a long screw back of the scale. The machine is built in two sizes for applying loads of 50,000 and 100,000 lb. The heights of the machines are 7½ ft. and 7 ft. 9 in. respectively. The floor spaces occupied are 84x80 in. and 90x80 in. respectively. Their weights are 4,250 and 5,750 pounds.

— 164 —

Scleroscope, Direct-Reading, Improved

Shore Instrument & Manufacturing Co., Jamaica, N.Y. [Vol.64,p.769.]

The improved, direct-reading scleroscope, model C-2, is for all-around testing purposes in manufacturing plants or laboratories. The testing machine, shown in the accompanying illustration, supersedes the model C-1 scleroscope. The flat clamping foot of the former



machine is replaced by a graduated barrel unit so reinforced that the specimen can be securely clamped directly under it. When used with its swing arm, the instrument can be located conveniently over the spot to be tested.

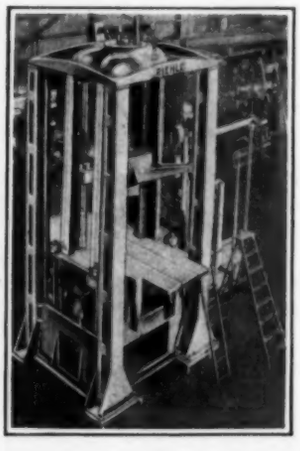
The standard rebound principle of the scleroscope is employed, and a production speed of 1,000 tests per hour is claimed for the machine.

— 165 —

Testing Machine, Power, Vertical-Screw, Universal

Riehlé Bros. Testing Machine Co., 1424 North Ninth St., Philadelphia, Pa. [Vol. 64,p.770.]

The machine shown in the accompanying illustration has a capacity of 1,000,000 lb., and is arranged for making tension, transverse and compression tests up to full capacity. Four guide columns are bolted to the base plate of the machine,



and held together with struts at the top. The arms cast on the moving head have shoes which travel against the inside corners of the columns. The weighing head is supported by three heavy columns, which parallel the screws and allow for the maximum of opening between the screws on three sides.

On the improved designs the rotating-screw feature has been retained so that no part of the machine projects below the base line. The single screw at the front of the machine rotates in the opposite direction to the other two screws. The driving motor runs continuously in one direction, and the starting, stopping and reversing are accomplished by the action of a single hand lever. Change gears are provided.

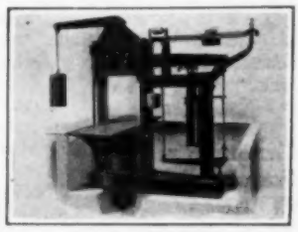
The test load on the specimen is indicated on a micrometer dial up to full capacity without the use of any weights. An automatic attachment can be provided for propelling the poise, and an autographic recorder can be used to produce a stress-strain curve.

— 166 —

Testing Machine, Locomotive and Car Spring

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.64,p. 839.]

The improved locomotive and car spring testing machine shown in the accompanying illustration is of



the hydraulic lever-weighing type. On the standard machine the table is built level with the floor to reduce handling.

The weighing system consists of a multiple-lever unit with knife edges inserted in machined slots, ground to an edge. The weighing system terminates in a scale beam which weighs the load to full capacity. The pressure is applied through an accumulator pressure of 1,000 lb. per sq.in. Operating valves are supplied, as well as an annihilator valve to reduce the shocks on the machine. Other accumulator pressures can be provided if desired.

The machine has a clearance between the uprights of 23 in. and between the table and head of 28 in. The stroke of the table is 24 in. The length of the machine is 11 ft. and its width is 6 ft. and 3 in. Its height above the floor is 5½ ft., and its total height is 10 ft. and 1 inch.

Capacities can be had of 100,000, 125,000, and 150,000 lb. The weights of the machines are 10,000, 11,000 and 12,500 lb., respectively.

— 167 —

Microscope, Micrometer, "Société Genevoise"

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol.64,p.177.]

The above company is marketing a micrometer microscope of the Fraunhofer type made by the Société Genevoise d'Instruments de Physique, Geneva, Switzerland. The instrument is suitable for the measurement of small machine parts, fibers, mesh of textiles, pitch and diameters of small screws, diameters of holes and for the observation of the characteristics of metallurgical samples and the deformation of test pieces. It will perform angular as well as linear measurements.

The micrometer screw is provided with either metric or inch threads and, by means of a vernier, readings to 0.001 mm. or 0.00005 in. can be made. The micrometer screw has a range of 30 mm. or 1.2 in.

The microscope is regularly supplied with Koristka objectives of 30 mm. focal length, having a magnification of 3 times, while the Ramsden eyepiece has a power of 8.3 so that the total magnification is 25 times. Other objectives of higher powers can be substituted when the dimensions of small particles, such as sand or cement, are desired.

The table in which the tube is mounted can be tilted through 90 deg. so as to point the microscope tube

horizontally. This permits measurement on the vertical face of objects set on the stage of the instrument. The diameter of the ground glass plate in the stage for the support of objects, is over 3 in., while a 2 in. adjustable plane mirror is provided below.

The maximum height of the instrument is 12 in. The net weight is about 15½ pounds.

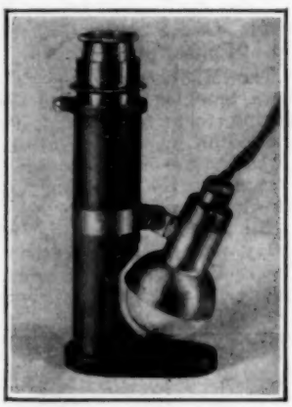
—168—

Microscope, Brinell, Illuminated

Pittsburgh Instrument & Machine Co., 1026 Reedsdale St., N.S., Pittsburgh, Pa. [Vol. 64,p.880.]

The microscope illustrated is for measuring the diameter of the impressions made by Brinell hardness testing machines.

The microscope is mounted in a vertical tube that is supported on a circular base. The aperture in the base for viewing the specimen is 10 mm. in diam. The interior



of the body tube surrounding the aperture is finished in white to increase the illumination of the specimen. An illuminating lamp is supported from a bracket clamped to the tube.

The focusing tube carries a Ramsden eyepiece and a 32 mm. achromatic objective. A 7 mm. micrometer disk graduated in tenths of a millimeter is provided and the eyepiece is focused on this disk.

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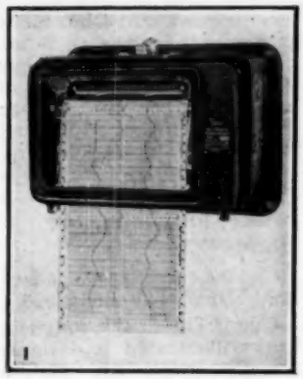
Pyrometers, High-Resistance, "Tycos"

Taylor Instrument Companies, Rochester, N. Y. [Vol. 64,p.176.]

The bi-record recording pyometer illustrated, an automatic pyrometer controller, a wall-type indicating pryometer and a single record instrument, all of the



high resistance type are being marketed by this company.

The two recording models are similar in construction, since the bi-record pyrometer is essentially two instruments under one cover, employing two independent milli-voltmeter movements. The record charts are six inches wide and will give a continuous record for 1,200 hours, divided into 24 hour periods. Either a 48-hr. spring clock or an electric clock can be supplied for the instrument. The weight of both models is 26 lb. and the size is 14x10x9½ in.

The indicating pyrometer is a pivoted-coil instrument. When used in conjunction with base-metal thermocouples the meter has a total resistence of from 300 to 900 ohms. When used with platinum-rhodium thermocouples the total resistence approximates 150 to 300 ohms. The weight of the machine is 8 lb. The length is 9 in., height 4 in. and depth of the case is 8½ inches.

The automatic pyrometer controller is essentially an indicator equipped with temperature control apparatus and, optionally, a signal device. The temperature setting is adjustable to any part of the scale range of the controller.

The controller instrument requires a circuit of 110 or 220 volts, 24 or 60 cycle a.c. current. The size of the controller is 8½x9x9 in. and it weighs 15 pounds.

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Controller, Pyrometer, Model 479

Bristol Co., Waterbury, Conn. [Vol.4,p.806.]

The model 479 pyrometer controller illustrated will control temperatures up to 3,000 deg. F. It is of the intermittent-correction type.

A small motor drives the switch-actuating mechanism and is controlled by a governor. The axis of the motor is horizontal, and its shafts is connected to the camshaft by means of a non-metallic coupling. The millivoltmeter pointer is moved about four times a minute. The base of the pointer is brought to rest against the anvil plate and the apex contacts with either one of the small switch buttons.

The top of the small buttons against which the steeple rests when the switch is making contact is a circle about ¼ in. in diam. A knife edge is placed in axial line with the index pointer and midway between the two buttons. The pointer is depressed on either side of this knife edge, and there can be no neutral position. Hence, with every contact the amount of heat supplied to the furnace is either increased or decreased.

The complete moving mechanism that supports the switch is assembled in a single unit, which is supported in a vertical bearing 6 in. in length. The switch-

supporting mechanism is held up against the depressor arm by a stiff spring, which also supplies the power to raise the switch. The motor-driven cam forces the depressor arm down against this spring during the periods when the pointer is free.

The index pointer is set by means of a small knob that is inclosed behind a hinged door. When this door is opened, the switch mechanism is forced to its lowest point and the millivoltmeter pointer swings free.

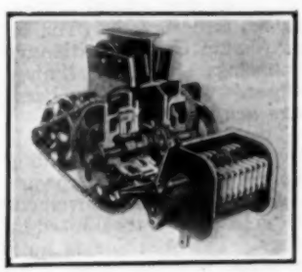
Material Handling

—171—

Hoist, Chain, Electric, Model 20 B

Yale & Towne Manufacturing Co., Stamford, Conn. [Vol.64,p.258.]

The model 20 B ball bearing electric chain hoist has been designed to provide for close head room, long lift, increased speed, automatic



top and bottom limit stops and greater overall strength than the former models built by the company. It is provided with an electrically welded steel chain in varying lengths to secure a balanced load on the trolley wheels and the hoisting unit.

The hoist mechanism is fully inclosed in oil-tight chambers and is compact and easily accessible for inspection. All pinions, gears and bearings are splash lubricated.

Steel chain containers can be furnished to hold any length of slack chain up to 60 ft. for the ¼-, ½- and 1-ton hoists, and 30 ft. for the 2-ton hoists. These containers are secured to the underframe of the hoist. The model 20 B is adaptable to different overhead systems. The side plates of the trolley carriage can be spaced on steel bars to fit the desired beam flange.

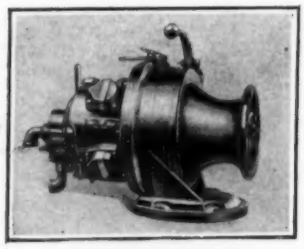
—172—

Hoist, Air-Motor, DU, "Utility"

Ingersoll-Rand Co., 11 Broadway, New York, N. Y. [Vol.64,p.419.]

The size DU "Utility" air-motor hoist, illustrated, is especially designed for use with portable compressors and is suitable for a wide variety of work. It can be attached to the rear end of a 5½ x 5 or 5 x 5-in. portable compressor, to the side of larger compressors, or to compressors mounted on Ford trucks.

The hoist as illustrated is provided with a winch head, but a drum can be substituted instead. A clutch is provided so that the cable can be easily played out by hand or by a down-grade load without turning over the motor and consuming air. A hand brake



on the drum is used to check or to stop the unwinding at any desired point whenever necessary. The throttle control furnishes any speed of rope travel desired up to a maximum speed of 65 ft. per min. under average loads.

The capacity of the hoist is for a load of 1,000 lb. Its rope speed under full load at 80 lb. air pressure is 61 ft. per min. The drum head will carry 350 ft. of ⅞ in. rope. The size of the hoist is 15 in. wide, 25⅜ in. long and 19¼ in. high. Its weight is 250 pounds.

—173—

Brake, Load, Friction, Safety, for Cranes

Canton Foundry & Machine Co., Canton, Ohio [Vol. 64,p.459.]

The illustration shows the safety load brake applied to a Canton improved portable crane similar to the one pre-

viously described on page 611, Vol. 47, of the *American Machinist*.

By means of the load brake, the load is held at any point, and it is necessary to wind the load down as well as to raise it. The brake consists of friction disks in connection with a helix. It is so designed that it can readily be applied to any of the usual types of portable cranes.

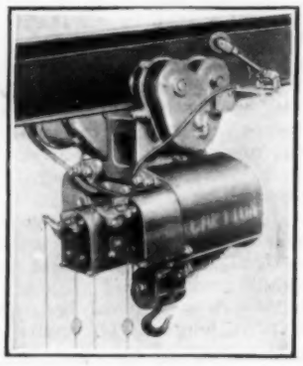
—174—

Trolley, Electric-Hoist, "Lo-Hed"

American Engineering Co., 2421 Ameringo Ave., Philadelphia, Pa. [Vol.64,p.536.]

The "Lo-Hed" motor-driven trolley is for use with the ½- and 1-ton class A hoists made by this company.

The trolley can be supplied with a travel speed of 80 or 120 ft. per min. It can be arranged for remote control. A headroom of 22 in. is required for the hoist and trol-



ley. All four wheels are power driven. Hyatt roller bearings are used on the hoist. Ball bearings are provided for the motor.

The motor can be furnished for either a.c or d.c. service, 2- or 3-phase.

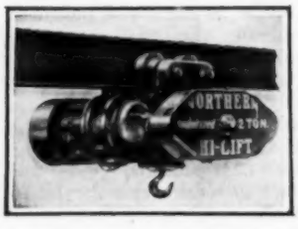
—175—

Hoist, Electric, "Hi-Lift"

Northern Engineering Works, Detroit, Mich. [Vol. 64,p.769]

The "Standart-ized Hi-Lift" electric hoist, illustrated, is designed to run on an I-beam or for stationary mounting, in places of limited height. Timken roller bearings are used throughout.

Two brakes are available for controlling and holding the load. Both the upward and the downward movement of the load hook are limited by stops. The machine is built in sizes ranging from 1 to 4 tons. The length of the hoist is 39½ in., the width 34 in. and the clearance 17 in. The standard hook lift is 20 ft. Any standard make of motor for hoisting service



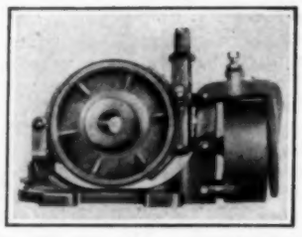
can be used. A 4-hp. motor is required for the 1-, 2- and 3-ton hoist, the full-load hoisting speed being 60, 30 and 20 in. per min., respectively.

—176—

Brake, Magnetic, for Hoists

Clark Controller Co., Cleveland, Ohio. [Vol.64,p.926.]

The "Three C" magnetic brake illustrated is designed for use with d.c. motors, either series or shunt wound. The brake is applied mechanically by means of a spring and is released through the action of a solenoid. The brake proper is in two halves



that give contact over almost the entire drum circumference. The lining is made from reinforced asbestos.

When the brake coil is energized the armature closes on the magnet case, and by means of inter-connected levers both halves of the brake simultaneously lift away from the drum an equal amount against the spring pressure. As soon as the armature is released the brake is set by spring pressure. It is claimed that the design is such that the armature does not rebound when the brake releases and that there is no hammer blow when the brake is set. It is claimed, also, that a comparatively low unit pressure on the wheel is obtained.

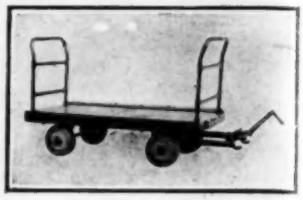
All castings are made of steel. The smallest machine has a wheel diameter of 8 in. and is rated at 15 hp. at 2,500 r.p.m. The largest machine has a wheel 24 in. in diam. and is rated at 150 hp. at 840 r.p.m. The corresponding continuous duty torques are 45 and 900 ft.-lb., respectively.

—177—

Trailer for Industrial Tractors

Crescent Truck Co., Lebanon, Pa. [Vol.64,p.695.]

The trailer illustrated is for use behind either gasoline or electric industrial tractors.



The truck has four wheels. Steering is accomplished by swinging the front axle about the "fifth wheel." The frame is built of T-iron girders braced with gussets at the corners. The wheels are semi-steel and are 12-in. in diam. They are provided with roller bearings lubricated by means of Alemite fittings. Ruboid wheels or solid-rubber tires can be supplied.

The platform size is 3 x 6 ft. The height is 15½ in. above the ground. A set of pipe racks is standard equipment.

—178—

Truck, Elevating-Platform, K23E

Yale & Towne Manufacturing Co., Stamford, Conn. [Vol.64,p.690.]

The K23E elevating-platform truck is similar to the low platform truck, K23, described on page 348, Vol. 59, of the *American Machinist*, except that the elevating feature has been added.

The frame is made of heavy pressed-steel sections. The truck is narrow in width and can turn on a short

radius. The steering pivots are made of hardened steel and turn in bronze bushings lubricated by a high pressure system.

The elevating platform is raised by means of links connected to the two large eccentrics mounted on the hoist unit shaft. The links draw the platform forward and upward. Mechanical limit stops are provided.

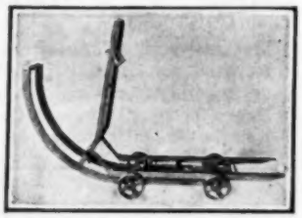
The spur-geared unit power axle is a sub-assembly that is interchangeable with all other models of the "K" series. The gear shafts are mounted on ball bearings. The control mechanism is also interchangeable with other trucks manufactured by this company.

— 179 —

Truck, Lift

Arcade Manufacturing Co., Freeport, Ill. [Vol.64,p.884.]

The lift truck illustrated consists basically of a frame in the form of an elbow which, at its lower end, carries the axles for four wheels 6 in. in diam. and 1¾ in. in width. The lifting platform is drawn upwards by means of a frame handle that is drawn back against the upper end of the elbow-shaped frame of the truck. A hydraulic release check is



provided so that the load can be lowered without jar or strain on the truck.

The length of the truck overall is 62 in., and its width is 17 in. The height of the truck when raised is 7⅛ in. and the amount of elevation is 1⅛ in. The wheel base is 19 in. long. The truck weighs 100 pounds.

— 180 —

Truck With Lifting Magnet

Baker-Raulang Co., Cleveland, Ohio.. [Vol.64,p.927.]

The small crane truck illustrated is equipped with an electric lifting magnet. The truck can be operated inside

of a standard box car and was designed to pick up loose castings on the car floor and to place them in skid boxes. It can also handle bagged material provided it is iron or steel.

The crane is known as the Type 5-477 and it has a rated capacity of 100 lb. at a 40-in. radius. The truck wheelbase is 40 in. and the tread 30 in. All four wheels steer. The hoist itself may also be sleeved or locked in its central position.

The power for operating the travel and hoisting motors as well as the magnet is supplied by a gas-electric unit manufactured by the Ready-Power Co., Detroit, Mich. A 4-cylinder Continental engine, governed at 1,000 r.p.m., drives a compound-wound ball bearing generator by means of a silent chain. The output of the generator is 250 amp. at 30 volts, while the engine output is 15.62 horsepower.

The magnet is 20 in. in diam. and is designed to operate on 1,320 watts. It is made by the Ohio Electric and Controller Co., Cleveland, Ohio.

Woodworking Machinery

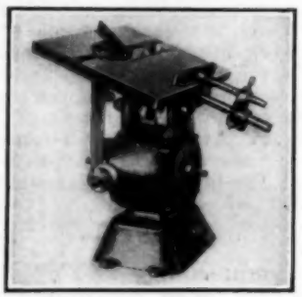
— 181 —

Saw and Arbor Universal No. 1

Winterhoff Tool & Machine Co., Elkhart Ave. & Jackson St., Elkhart, Ind. [Vol.64, p.37.]

The No. 1 universal saw and arbor is intended for bench use and is driven from a ¼-hp. 1,750 r.p.m. motor at 3,400 revolutions per minute.

The table measures 10x12 in., and it can be raised and lowered, or tilted as desired.



A milled groove is provided for the protractor cutoff or ripping guides.

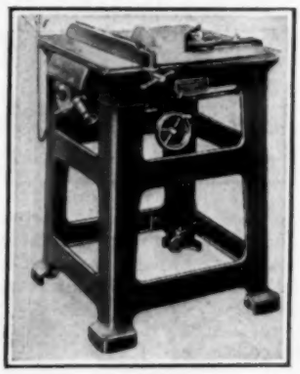
A 6-in. saw, an 8-in. metal disk sander or a 6 x ½-in. tool-grinding wheel can be mounted on the arbor.

— 182 —

Saw, Universal, Portable No. 8

J. D. Wallace & Co., Chicago, Ill. [Vol.64,p.655.]

The No. 8 portable universal woodworking saw is a factory production machine



designed to relieve larger fixed machines to increase production in mill departments or pattern shops, or to use in assembling or shipping rooms.

The table, which is of one piece of finished steel 25-in. square, has a capacity of 12x2¾ in. between the blade and fence. It is designed for straight or angle cutting, either rip or cross-cut. To cut angles the saw is tilted instead of the table. Right or left hand mitering can be done up to 50-deg. The saw is driven by a 1-hp., 3-phase motor.

— 183 —

Knives, Planer, High-Speed Steel, Inlaid

Henry Disston & Sons, Inc., Philadelphia, Pa. [Vol. 64,p.692.]

A high-speed steel cutting edge is being used in the A-1 machine knives. This steel is used to give the knives a cutting edge capable of standing up under heavy service.

The steel is being used also in the Disston "lock-weld" inlaid knives in which a section of the steel is inlaid in a carbon steel back. The thickness of the inlaid section is of the same degree over its entire length, so that the knives can be reground as much as may be necessary.

— 184 —

Saw Table, Portable, "Wonder"

St. Louis Machine Tool Co., 1429 Pine St., St. Louis, Mo. [Vol.64,p.998.]

The "Wonder" portable saw table is being marketed for use with either cut-off or rip saws. The saw table can be furnished with either an electric or a gasoline motor.

The saw regularly furnished with the table is 12 in. in diam. It rotates at 2,100 r.p.m. Rip, cross-cut, or any standard saw can be used. A graduated gage for mitering is supplied in addition to

the guides for cross-cut and rip-saw work. The ripping fence or gage can be tilted to an angle of 45 deg. and is brought back to square against a stop. The table top measures 24x36 inches.

The electric motor is 1 hp., either d.c. or a.c. The latter is supplied for 110, 220, or 440 volts, 60 cycles, single phase. It is ball bearing equipped and rotates at 1,750 r.p.m. The motor is semi-inclosed. The gasoline motor is also rated at 1 hp. at 1,750 r.p.m. It is a 1-cylinder, 4-cycle motor, and has a built-in flywheel magneto, a set-jet type of carburetor with an air cleaner, and an adjustable centrifugal-type governor. Lubrication is by splash and pump feed.

Small Tools

— 185 —

Drills, Forged

Morse Twist Drill & Machine Co., New Bedford, Mass. [Vol.64,p.36.]

The forged drills added to this company's line are made in sizes ranging from $\frac{1}{16}$ to 2 in. inclusive, and vary in $\frac{1}{16}$ in. steps. The shanks used on the forged drills range from the No. 2 to the No. 5. Either the forged or the milled type can be obtained.

— 186 —

End Mills, Two-Lip, Spiral-Cut

Union Twist Drill Co., Athol, Mass. [Vol.64,p.76.]

The end mill illustrated is made with two spiral flutes and with end teeth cutting to center. It is used largely for milling keyways.

The mills have either straight or taper shanks and are made of high-speed steel heat-treated. The hand of the

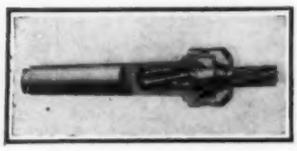
spiral is the same as the hand of the cut or a right-hand spiral for a right-hand cut and vice versa.

—187—

Chuck and Double-End Mill

Thurston Manufacturing Co., Benedict Street, Providence, R. I. [Vol.64,p.178.]

The complete device, illustrated, consists of a collet, or ringchuck, that grips the cutter by an enlarged shoulder midway of the length of the latter, and a taper shank to fit the spindle of the milling machine. Two substantial driving lugs, made integral



with the shoulder of the mill and engaging corresponding driving slots in the face of the collet, insure a positive drive.

The collets are made in five sizes, with a range of taper shanks to suit the customer's requirements. The mills are made in sizes ranging from ¼ to 1¼ in. in diam., with straight flutes or with right- or left-hand helical flutes as desired. The line includes two-lipped center-cut mills, as well as mills with a standard number of cutting lips.

—188—

Cutter, Deep-Slotting, Type F

Lovejoy Tool Co., Inc., Springfield, Vt. [Vol.64, p.534.]

The type F cutter shown in the accompanying illustration is for deep-slotting work.

The blades used in the cutter are held by means of

this company's positive-locking device. They are provided with a slight side clearance and the angle at which they are set in the cutter is dependent on the cutting width of the tool. The side angle at which they are set permits the maintaining of a definite width as the blades are adjusted outward previous to grinding.

The cutters are manufactured in widths of from ⅜ to 1½ in. and in diameters of 6 in. and larger.

—189—

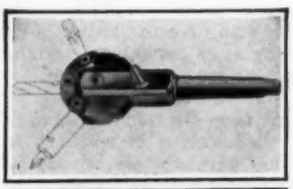
Tools, Drilling and Boring

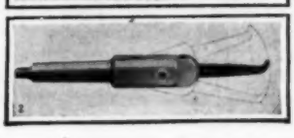
Maxwell Products Co., 7513 *Indiana Ave., Cleveland, Ohio.* [Vol.64,p.655.]

A special three-tool holder for drilling operations and an improved boring tool are being marketed by the above company.

The former is called the M-P three-tool turret since the tools are successively indexed into position and locked in place with a pin. The tools shown in phantom are for centering, drilling and reaming, but other combinations may be employed. The tool is intended to be inserted in the tailstock of a lathe.

The E-Z-Set boring tool can be used in a drill press, screw machine, milling machine, or





lathe. It can be adjusted to bore a wide range of holes. The cutter as shown can be supplied in either high speed or carbon steel, or a special holder for an inserted cutter but can be ordered. The shank is a separate piece and screws into the holder.

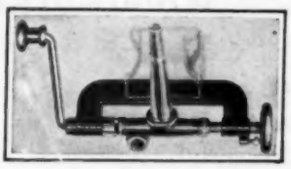
The tool is made in three sizes. The tool bit size ranges from ⅛ to ⅜ in. in diam., the straight shank from ⅜ to 1¼ in. in diam., the Morse taper shank from No. 2 to No. 4 and the B.&S. taper tank from No. 7 to No. 10. The shanks are separate units so that they can be interchanged for use in different holders.

—190—

Tool, Refacing, for Ford Steering Gear Bushing

Stevens & Co., 375 *Broadway, New York, N. Y.* [Vol. 64,p.733.]

A tool for refacing the steering-gear bushings of Ford cars has been placed on the market. The device, illustrated, is a combination



fixture and cutting tool. The tool itself is a hollow end-mill and is rotated by means of a crank. The crank and tool assembly is supported at the right end of a C-frame and the stub end of the crank shaft is a centering piece for the steering-gear bushing. At the right end of the frame is a dead-center locating piece that is screw adjusted by means of a hand-wheel, which also feeds the work into the tool. The advance of the work is limited by an adjustable stop-screw which is set by means of a gage pin before the bushing is inserted in the fixture.

The tool weighs 4½ pounds.

—191—

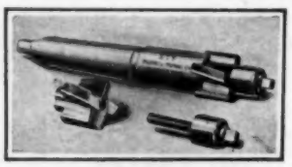
Counterbore, "XTY"

Bicknell-Thomas Co., Greenfield, Mass. [Vol.64,p.767.]

The Christy "XTY" line of counterbores with interchangeable bits and pilots is made in all commercial sizes ranging from ½ to 2½ in. in diameter.

The holders are of nickel steel, hardened and ground. They are furnished in six sizes to cover the range of cutting bits, and with parallel or standard taper shanks. The driving shoulder is mortised to match the section of the cutting bit.

The cutting bits are section-rolled, high-speed steel,



twisted by a special method that gives them a cutting rake comparable to that of a twist drill, and are finished all over by grinding. They are secured to the holder by a collar-head screw.

The separate pilot allows many combinations of sizes with respect to the diameter of the pilot hole. A one-piece bit and pilot can be furnished if desired. Bits with four lips are supplied for general-purpose counterboring, and two-lipped bits can be furnished.

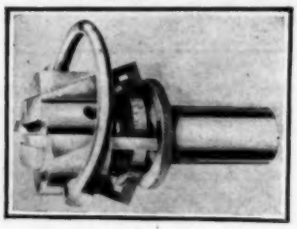
Countersink bits are furnished of any desired angle to fit any of the holders.

—192—

Mill, Hollow, Adjustable

Reisinger Machine Tool Corporation, 839 *Lake Ave., Rochester, N. Y.* [Vol.64, p.840.]

The adjustable hollow mill illustrated is made in six sizes, giving a cutting range of from ⅛ to 2½ in. It has a graduated adjustable dial



that moves the blades backward or forward the amount needed to set the tool. A single-acting locking lever locks or releases all of the cutters at the same time. No wrenches are required to make adjustments. The features claimed for the hollow mill are accuracy, quick adjustment and a minimum number of tools for a wide range of cut diameters.

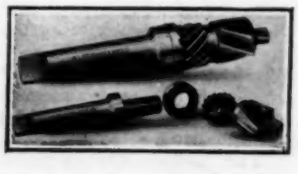
—193—

Drill, Reamer and Countersink, Combined

W. L. Brubaker & Bros. Co., 50 *Church St., New York, N. Y.* [Vol.64,p.998.]

A tool designed to drill, ream and countersink flue sheets has been placed on the market. It will do the three operations in one.

The tool can be furnished in any size desired and with any style or size of shank. The drill bit, the reamer and the countersinking tool are each a separate piece. The drill bit acts as a nut to hold the other two tools on the shank. Worn parts can be replaced.

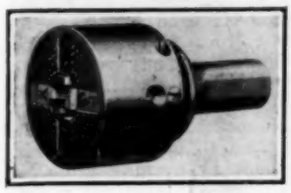


— 194 —

Diehead, Self-opening, Style R, "Namco"

National Acme Co., Cleveland, Ohio. [Vol.64,p.179.]

The diehead illustrated has been designed for use on multiple-spindle automatic screw machines. It supersedes the



No. OH-64H diehead previously manufactured by this company. The diehead is hardened and ground throughout. It is designed to utilize a minimum number of parts. It can be taken apart readily for cleaning or replacing worn parts. The chasers are opened and closed by means of cams on the inside wall of the cup or hood. An attachment in the form of a fork is used to operate the diehead.

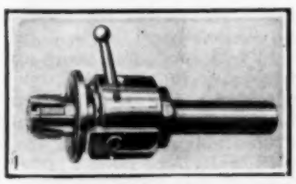
The chasers which are interchangeable with those of a former model are of the overhung type to permit threading close to a shoulder. The style R dieheads are built with seven capacities for cutting diameters of from ¼ to 2½ inches.

— 195 —

Taps, Adjustable and Collapsing, Class S

Geometric Tool Co., New Haven, Conn. [Vol.64,p.180.]

The Class S adjustable and collapsing taps have been brought out in four models, two of which are illustrated.



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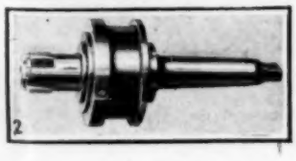


2

The front ends of the taps are of large diameter to increase the strength. Chip clearance grooves have been milled in front of each of the four chasers to permit the chasers to cut freely and without packing. The mechanism is completely inclosed and protected against dirt an chips.

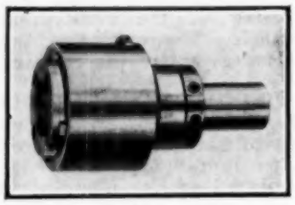
The chasers are designed so that their thickness will provide a long grinding life and are short in order to enable the use of a heavy front-end construction. They are supported along their full length.

— 196 —

Diehead, Revolving, Type O, Improved

Murchey Machine and Tool Co., 953 Porter St., Detroit, Mich. [Vol.64,p.218.]

The type O diehead, illustrated, designed for use on automatic machines with a revolving spindle. It is opened by means of a trip provided on the machine and is closed by means of a yoke when the spindle is returned.



Removal of the chasers is accomplished without taking off the cap and without the necessity of removing the tool from the spindle of the machine.

Advantages claimed for the diehead are that the chasers can be quickly removed without the aid of a screwdriver and that the location of the adjusting ring is convenient. All parts are hardened and ground.

— 197 —

Reamer, King-Bolt Hole, Spiral

Watervliet Tool Co., Albany, N. Y. [Vol.64,p.297.]

The spiral reamer, illustrated, is for use in securing alignment of king-bolt holes. The reamer has a pilot which enters the lower bushing before the tool begins to ream the upper bushing.

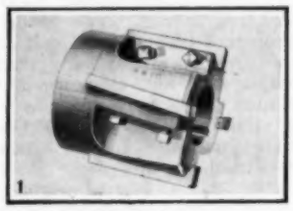
The pilot of the reamer is self-cutting. By this means the rough cutting is first accomplished, while the reamer itself does only the finish cutting as it follows the aligning pilot. The reamers are made from tool-steel, heat-treated in electrically-controlled gas furnaces.

— 198 —

Cutters, Model M, and Reamers, Model D

Kelly Reamer Co., Cleveland, Ohio. [Vol.64,p.334.]

The Model M cutters are designed for roughing purposes. As standard they have four blades. The bodies are made of manganese-



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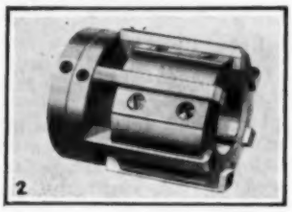


2

chrome alloy steel and heat-treated. The blade slots are evenly spaced but on a right-hand spiral. Adjustment is secured by the forward movement of the blades on an inclined plane. A support screw backs up each blade so that the expansion can be secured accurately.

The Model M cutter for use on an arbor is made in sizes of from 1⅛ to 4 in., in steps of 1/16 in. The Model MA cutter, which is shown in Fig. 1, is furnished with an extra large straight-hole for line cutting. The range of sizes is from 1⅛ to 3½ in. The Model MF cutters are for chuck use and can be had with straight or taper shanks in sizes of 1⅛ to 3 inches.

The finishing reamers have six blades in the smaller sizes and eight or more on the larger diameters. The blade slots are milled parallel to the axis of rotation but at unequal spacing from each other. One side of the blades is tapered to fit the hardened wedges which extend from the front end of the body to the threaded section.

The rear section of the body is threaded to take double adjusting collars. Since the blades fit in grooves that are milled on an inclined plane, when the collars are screwed forward the blades are forced to expand outward and forward. The thread is of a fine pitch.

The Model D.E. is a hand reamer on the shank of which guide bushings can be used. The bushings are hardened and ground and can be held in any position on the shank by means of a setscrew. They are made in sizes of 1 to 3 in. in diameter.

The Model D shell reamers for use on arbors are made in sizes of from 1 3/16 to 6 in. Fig. 2 shows the Model DA shell reamer with a straight hole provided for line reaming. It is made in sizes ranging from 1¼ to 3½ in. The Model DF reamer for chucking purposes is made with straight or taper shanks in sizes of from 1 to 3 in. in diameter.

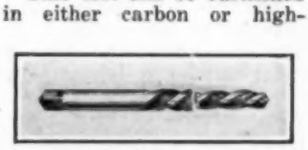
— 199 —

Reamer, Taper-Pin, 3-Flute

Morse Twist Drill & Machine Co., New Bedford Mass. [Vol.64,p.653.]

The 3-flute taper-pin reamer, illustrated, is being marketed by this company. The flutes wind in a left-hand spiral, and the cutting action is said to be fast and easy. The spiral flutes give a shearing cut and readily clear themselves of chips. The taper is ¼ in. per foot.

This tool can be furnished in either carbon or high-



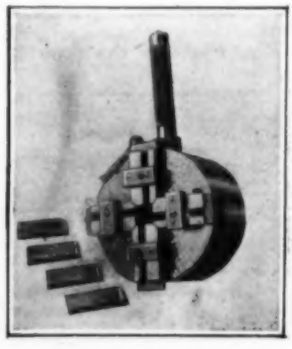
speed steel. It is made in nine sizes ranging from 0.119 in. in diam. at the small end for the size No. 0, to 0.398 in. in diam. at the small end for the size No. 8. The total length varies from 2¾ to 6¾ inches.

— 200 —

Diehead, Adjustable "Darling"

Bicknell-Thomas Co., Greenfield, Mass. [Vol.64,p.691.]

The "Darling" adjustable diehead is designed especially for the use of tap manufacturers for threading taps.



The head has four sliding jaws adapted to use inserted chasers, and it covers a range of tap sizes of from ¼ to ⅝ in. in diameter.

The shoulder of the knurled handle which actuates the sliding jaws is made triangular in shape where it bears against the fixed stop in the body to regulate the size, and by turning this handle to bring the different faces into contact with the stop the effective diameter cut by the chasers is altered. By means of this arrangement a tap blank may be threaded in three successive operations; rough, semi-finish, and finish cuts.

— 201 —

Diehead, High-Speed, No. 7-H, "Hartness"

Jones & Lamson Machine Co., Springfield, Vt. [Vol.64, p.770.]

The No. 7-H improved "Hartness" high-speed diehead has been placed on the market by this company. The No. 4, type R, diehead was previously described and illustrated on page 44, Vol. 51, of the *American Machinist*.

The No. 7-H model has a capacity of from ¾ to 2 in. The chasers for the diehead are ground and lapped.

— 202 —

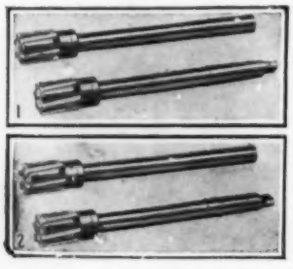
Reamers, Adjustable, Types 10 and 11

Wetmore Reamer Co., Milwaukee, Wis. [Vol.64,p.839.]

The types 10 and 11 adjustable reamers with arbors integral are similar in design to the types 2 and 6 previously described on page 1205, Vol. 50, and page 195, Vol. 56, respectively, of the *American Machinist*. The latter reamers are manufactured with separate arbors.

Left-hand angle-cutting blades are used in the reamers. The front cutting edge of each blade is set on a 3-deg. angle. The threads of the reamers are milled on centers. The blades adjust forward to increase the diameter.

Fig. 1 shows the type 10



standard with the taper and straight-shank arbors. Adjustments to 0.001 in. can be made in the diameter of the reamers. The range of sizes is from 1 to 2⅛ in. in sixteenths of an inch.

In Fig. 2 is shown the type 11 adjustable heavy-duty reamer with taper and straight shank arbors. A large range of adjustment is provided to allow for wear and regrinding. The blades project ¼ in. over the end of the reamer body so that chips will not clog up the blades. This type is made in a similar range of sizes to the type 10. Larger sizes can be made to order.

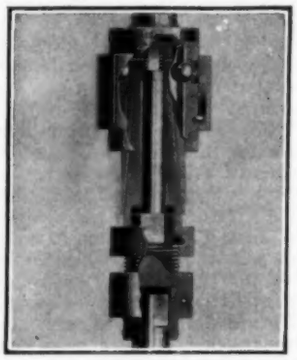
— 203 —

Collets, Friction

Titan Tool Co., Erie, Pa. [Vol.64,p.36.]

A line of friction collets for use in tapping or stud setting is being manufactured by this company. A phantom view of the collet mounted in this company's "quick change" chuck is shown in the illustration.

The collet is designed for use in connection with this



type of chuck. It is held in place by means of steel balls which are, in turn, inclosed by a collar. By raising the collar, which is recessed on the inside, the collet can be removed from the chuck.

The advantages claimed by the makers are that all adjustments can be made while the unit is set up, and that the collet will not become set from excessive thrust in starting the tap into the work. They are furnished in several sizes for U. S. Standard taps.

— 204 —

Chuck, Tapping, Reversing, "John"

Barber-Colman Co., Rockford, Ill. [Vol.64,p.295.]

The "John" tapping chuck is designed to convert drills or speed lathes into tapping

machines. It drives the tap direct from the spindle through its internal clutch and friction drive member. The friction drive can be adjusted to drive small taps without forcing them to the breaking point, or it can be set to act as a nearly positive drive for the heavier taps. The tap is fed into the work and automatically reversed by the lowering and raising of the drill press spindle. The reversing speed is twice that of the forward speed.

The chucks are made in two sizes: No. 1 for taps up to ⅝ in., and No. 2 for taps up to ⅞ in. They are equipped with Morse Nos. 2 and 3 taper shanks, respectively.

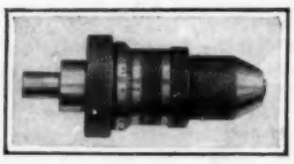
— 205 —

Chucks, Tapping, Safety

Wahlstrom Tool Co., 5524 *Second Ave., Brooklyn, N. Y.* [Vol.64,p.999.]

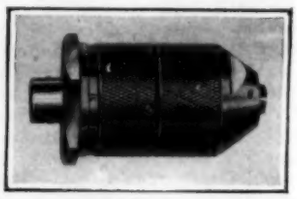
Three sizes of safety chucks have been placed on the market for bottom-hole tapping. The No. 201 special chuck for taps up to ¼ in. is shown in Fig. 1, while in Fig. 2 is shown the No. 202 chuck for ⅛ to ⅝ in. The No. 203 chuck is designed for taps up to ⅝ in. in size.

The chucks can be set to a tension at which they will release the taps to prevent breakage. They can also be



used for driving studs. The No. 201 chuck has a top cover that takes the thrust of the main spindle and which can be used for the setting of the tension. It has a scale that can be used in connection with the arrow and a tension sleeve to show the degree of tension. The tension sleeve is used to adjust the spring tension by turning from right to left, using the arrow as a starting indicator. The lock nut is used to tighten the tension sleeve. The bottom section holds the tapping or stud-driving jaws.

The larger chuck has a top cover which takes the thrust of the main spring. It has an arrow on its side which is used as a starting indicator for the scale on the body. The body is made of two shells. The inside shell holds the main spring and ball sockets. The outside shell is used to adjust the spring tension by turning from left to right. It also has a scale



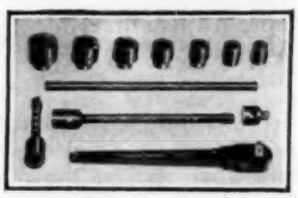
for reading the tension and a setscrew to lock the shell, at a predetermined tension.

— 206 —

Wrench Set, Quick-detachable, No. 12

Blackhawk Manufacturing Co., Milwaukee, Wis. [Vol. 64,p.179.]

The No. 12 quick-detachable industrial wrench set, illustrated, is known as the "extra heavy-duty" set for service in power plants and



railway shops. It includes a 20-in. ratchet wrench handle, one sliding bar 1 in. in diam. and 24 in. long, one short extension ¾ in. in diam. and 9 in. long, one 18-in. extension, one offset adapter, and seven hexagon sockets for bolts ranging from 1¼ to 2⅜ in. in size. The pieces are contained in a wooden box and the weight is 46 pounds.

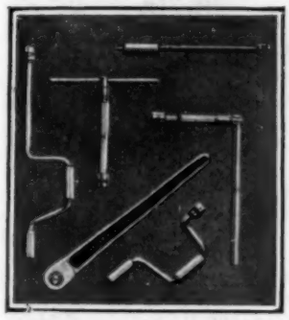
— 207 —

Wrenches, Ratchet and Hexagon-Socket

Husky Wrench Co., 27th and Florence Sts., Milwaukee, Wis. [Vol.64,p.336.]

Some of the additional units to this company's line of wrenches are shown in the accompanying illustration.

The H.D.1, 20 in. ratchet is



for heavy duty service and has a drop-forged handle. The No. 21 speeder is 20 in. long. It has a shank 10 in. long and the end is upset, forged on and milled. The No. 17 brace is similar in design, but the shank is 2 in. long. The No. 9, 10-in. and the No. 11, 15-in. swivel extensions have solid milled ends and a hexagon swivel grip. The No. 14, 15-in. combination "T" is for the standard husky set. It provides a 15-in. leverage and has an alloy steel hardened head.

Square sockets are made in 9 additional sizes of from ⅜ to 1 in. Four large hexagon sizes for industrial purposes range from 1⅛ to 2½ inches. Several lines were previously described in the *American Machinist*.

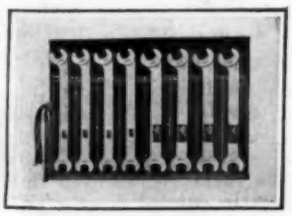
—208—

Wrenches, Chrome-Vanadium

Bonney Forge & Tool Works, Allentown, Pa. [Vol. 64,p.338.]

The double open-end wrenches, illustrated, and also a line of socket wrenches are being made from chrome-vanadium steel. By the use of this material, and special heat-treatment, the company has aimed for refinement in design, particularly as to the thickness of the side walls, so that the wrenches will be more adaptable to use in close or confined places.

The socket wrenches are made in three styles: the offset type, the T-handle type



and the brace type which is made in 20- and 30-in. sizes. They are of one-piece construction. A ball bearing handle is provided for the brace-type wrenches.

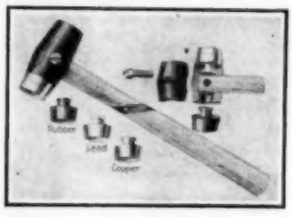
—209—

Hammer, Soft-Tip, Interchangeable

Husky Wrench Co., 928 Sixteenth Avenue, Milwaukee, Wis. [Vol.64,p.377.]

The patent and manufacturing rights to the interchangeable soft-tip hammer illustrated have been acquired by this company. The hammer is made in 2- and 4-lb. sizes.

The hammers are supplied with interchangeable soft tips of copper, lead, rubber or other material as desired.



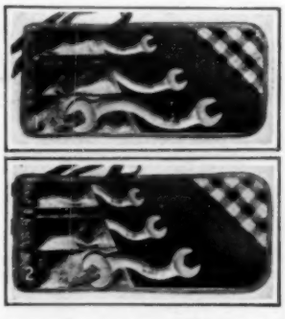
They are marketed in sets with two of each kind of tip. The tips can be replaced after loosening the fillister-head screw and separating the housings. The handle is made from second-growth hickory and is balanced.

—210—

Wrench Kits

Bonney Forge & Tool Works, Allentown, Pa. [Vol. 64,p.840.]

Two additional lines of chrome-vanadium wrenches have been placed on the market by this company. Fig. 1



illustrates the millwright's kit, while in Fig. 2 is shown the loom fixer's kit.

The millwright's kit consists of "S" wrenches designed for the work and made lighter, thinner and stronger than the earlier type. The loom fixer's wrenches are designed particularly for repairmen in textile mills. They are of a short and stocky design and are heat-treated. Both sample sets are furnished in a leatherette kit for convenience.

—211—

Wrench, Steel, Chrome-Vanadium

Armstrong Bros. Tool Co., 315 North Francisco Ave., Chicago, Ill. [Vol.64,p.841.]

The chrome-vanadium steel wrench shown in the accom-

panying illustration is an improvement over the alloy steel wrench which has been manufactured by the company for some time.

The wrench is drop-forged and heat-treated. It is finished in nickel over copper and the heads are buffed bright. The jaws are of a thin and narrow design.

—212—

Shear, Corrugated-Sheet, Portable

Joseph T. Ryerson & Son, Inc., 16th and Rockwell Sts., Chicago, Ill. [Vol.64,p.963.]

The portable shear illustrated is for the straight or curve cutting of corrugated sheets without distortion.

After the cut is started, no effort is required to feed the shear into the work.

The cutting is accomplished by a pair of rotary double-edged cutters, knurled around the shearing edges. The upper cutter is driven by an internal ratchet which is operated by the handles. The lower cutter runs free. The driving cutter is adjustable by means of a capscrew so as to assure a continuous, even feed on all sheets within its capacity, which is up to 20 gage.

—213—

Vise, "Big Bear"

Charles Parker Co., Meriden, Conn. [Vol.64,p.654.]

The "Big Bear" vise is provided with an anvil on the

stationary jaw for the convenience of machinists. A setscrew and tension spring hold the handle of the vise in the position in which it is placed.

The vise is made in two types and two sizes in each type. They are made with 4- and 5-in. jaws to open 5½ and 6 in., respectively, and are provided with stationary or swivel bases. The swivel type can be clamped in any position around its 360 deg. of movement. The weights of the 4- and 5-in. stationary-type vises are 76 and 102 lb., respectively. The swivel-base vises weigh 89 and 112 lb. for the 4- and 5-in. sizes, respectively.

—214—

Table and Vise, Drill, Combination

Modern Machine Tool Co., Jackson, Mich. [Vol.64,p. 734.]

A larger size of the combination drill table and vise, illustrated, has been added to this company's line. The table is 27½ in. in diam. and it is similar in design to the

19-in. table previously described on page 203, Vol. 58 of the *American Machinist*.

The jaws of the vise will open 12 in. and they are 27½ in. long. The jaw guides which are 10 in. apart and 4 in. wide, give a jaw support of 18 in.

The tool has a 1½ in. square-thread screw working in a bronze nut 3½ in. long. The complete table and vise weighs about 580 pounds.

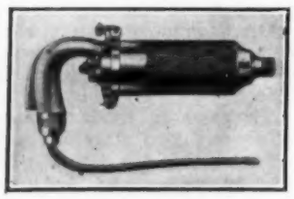
—215—

Hammer, Electrical

Fermot Co., 200 Broadway, New York City. [Vol.64,p. 499.]

The "Simbi" electrical hammer is being placed on the market by the above company. The hammer is operated by hand and resembles in size and shape a pneumatic

hammer. The tool was originally designed for the use of sculptors and other stone workers but the large sizes may readily be adapted to such work as calking pipe or plates, chipping, cleaning boiler tubes, drilling stone or concrete, and the like.



The hammer operates on the electro-magnetic principle. An alternating current solenoid actuates a movable plunger whose recoil is governed by means of an adjustable helical spring. With 60-cycle current, the frequency of percussion is 7,200 strokes per minute so that there is little noticeable vibration. Fatigue on the part of the operator is minimized.

The two commercial sizes are types C and D. Type C consumes 100 watts and weighs 7 lb. It can bore holes up to ⅝ in. in diam. Type D consumes 200 watts and weighs 10 lb. It is suited for rougher work and can drill holes up to 1 in. in diameter in stone.

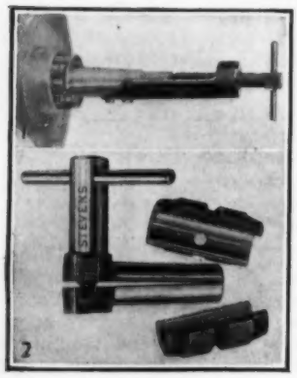
—216—

Tools for Fords

Stevens & Co., 375 Broadway, N. Y. [Vol.64,p.690.]

Two tools for facilitating repair on Ford cars have been added to the line of "Speed-Up" tools manufactured by this company. Fig. 1 shows a device for use in removing the Hyatt bearing assembly from the rear axle, while Fig. 2 shows a tool for splitting the camshaft bearing.

The tool for removing the Hyatt bearing has a steel toe at its end that is hooked under the edge of the cage.



By placing the end of the handscrew against the end of the axle and by turning the screw, the bearing can be pulled off the axle. The tool weighs 14 ounces. The tool for splitting the camshaft bearing consists of a split cylinder that is pivoted at one end and opened at the other by means of a screw. A fraction of a turn of the handscrew is sufficient to split the babbit lining.

The device weighs one pound.

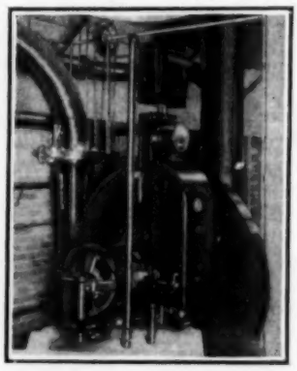
Miscellaneous Equipment and Supplies

—217—

Compressor, Centrifugal

General Electric Co., Schenectady, N.Y. [Vol.64,p.259.]

The centrifugal compressor, illustrated, is for supplying air to oil-burning furnaces. It is designed to



deliver 1,800 cu.ft. of air per min. at a pressure of 1½ lb. per sq. in. It operates at a speed of 3,450 r.p.m. and is directly connected to a 20-hp., 3-phase, 220-volt, 3,600-r.p.m. induction motor. Lubrication is afforded by means of the pressure system.

The motor is controlled by means of a General Electric hand compensator. A special callibrated scale on the ammeter reads in amperes and in cu. ft. of air per min. The desired volume of air to be delivered can be secured by adjusting the blast gate in the air line.

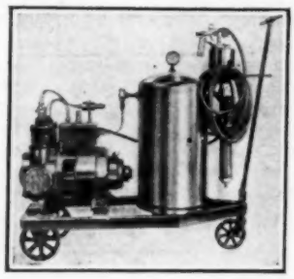
—218—

Compressor Unit, Air, Portable, "HB"

Hobart Bros. Co., Canal Locks Square, Troy, Ohio. [Vol.64,p.539.]

The portable air compressor unit, illustrated, is designed for paint spray work, cleaning and blowing and for light pneumatic tools.

The motor is equipped with ball bearings. It drives the compressor through a bevel gear. The compressor is of the twin-cylinder reciprocating type. It pumps 8 cu.ft. per min. at a discharge pressure of 85 lb. per sq. in. A 15-gal. accumulator is provided. The motor compressor unit and the tank are mounted on a steel frame.



The paint spray equipment consists of a spray gun, a "KO" cup, and 25 ft. of hose. For electrical connections 25 ft. of cable is furnished. The over-all dimensions are 33x18x48 inches.

—219—

Lubrication, Pressure

Bullard Machine Tool Co., Bridgeport, Conn. [Vol.64, p.37.]

The mult-au-matics, continu-matics and vertical turret lathes manufactured by this company are being equipped

for lubrication by the grease-gun or pressure system at various points on external units.

The pressure system has been adopted to overcome the problems that arose at these points where the accumulation of dirt and chips tended to clog the oil holes.

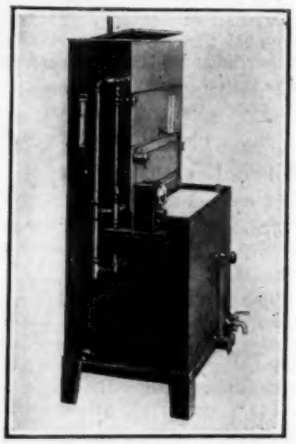
—220—

Filters, Oil

Wm. W. Nugent & Co., 410 North Hermitage Ave., Chicago, Ill. [Vol.64,p.576.]

Three types of oil filters are being manufactured by this company. The triple-bag cabinet type, illustrated, is designed to separate all foreign matter, including water, from oil. The top part of the cabinet is divided into three sections. In the dumping tray the oil passes through 2 in. of washable filtering material that removes most of the heavy foreign matter but not the water. In the precipitating chamber the water settles to the bottom and is drawn off. The oil flows through a pipe to the filtering bags. Three thicknesses of filtering cloth are provided.

The oil is heated in the top chamber by means of steam coils or by electricity. A door in the third compartment permits an inspection of the filtering bags to be made as well as their easy removal.



An alarm mechanism operates if the bags become clogged.

The cabinet type is made in four sizes ranging in capacity from 12 to 30 gal. of 13½ to 34 sq. ft. respectively. The clean oil storage per hr. with filtering surfaces is 21 gal. for the smallest and 65 gal. for the largest size.

The second type of filter is designed to clean any kind of lubricating or cutting oil that is free from water. It consists of a series of filter cloth bags suspended from a suitable rack. A steam pipe or electric coil heats the dirty oil as it enters. The filtering process is continuous. An automatic bell-alarm notifies the operator that the bags require cleaning. This type

of filter is made in 27 sizes ranging in capacity from 40 to 2,000 gal. per hr. and employing from 1 to 40 bags.

The third type is designed for marine and locomotive Diesel engines. It is similar to the second type except that provision is made to prevent spilling during the rolling of a ship or the swaying of a locomotive. The cover is clamped down with wing nuts and besides sealing the tank as a unit, it also covers the upper part of each trough from which the filtering bags are suspended. An automatic bell-alarm is provided.

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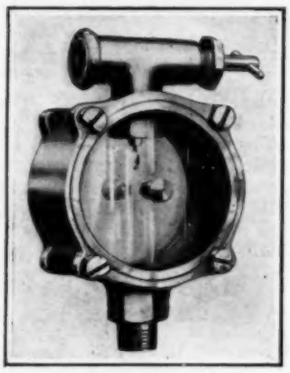
Valve, Sight-Feed

Wm. W. Nugent & Co., 410 *North Hermitage Ave., Chicago, Ill.* [Vol.64,p.615.]

A sight-feed valve, illustrated, for lubricating large engines and bearings consists



of a T-shaped valve provided with a hand control, pipe connection and a drop nipple, together with a glass-inclosed compartment through which the oil drops fall and can be observed.

The two glass walls are 3 in. in diam. and have convenient handles in the center to facilitate removal for cleaning. There is a vent hole to prevent air binding. The device may be set at any angle that is advantageous to the operator.

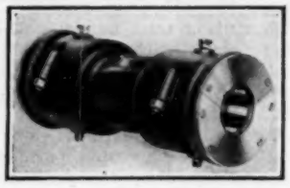
— 222 —

Bearing, Lineshaft

Hyatt Roller Bearing Co., Newark, N. J. [Vol.64,p.655.]

A split lineshaft bearing of the dumb-bell shape with roller bearing assemblies mounted at both ends is being marketed by this company. The bearing is designed for replacement in plain bearing hangers of the narrow type.

The bearing assemblies are split and are of the type



recently adapted for high-duty bearings. The rollers are the usual helical-wound Hyatt type. The box is built in two sections, the lower part forming two-thirds and the top one-third of the assembly. The sections are held together by four bolts, the bosses for which are staggered.

Tests are claimed to indicate that fifteen per cent power can be saved. Lubrication is recommended for every three or four months. They are being manufactured in $1\frac{7}{16}$, $1\frac{11}{16}$, $2\frac{3}{16}$, $2\frac{7}{16}$ and $2\frac{11}{16}$ in. sizes.

— 223 —

Grease Tubes for Ball-Bearing Motors

Fairbanks, Morse & Co., Chicago, Ill. [Vol.64,p.734.]

In order to simplify the lubrication of ball-bearing electric motors four sizes of collapsible grease tubes are being marketed. The illustration shows the method of using the tubes. The four sizes correspond to the various sizes of bearings. The amount of grease contained in each is said to be sufficient for a year's supply of lubricant for the bearing sizes specified. The old grease first must be flushed out and then the contents of

the tube are squeezed into the housing.

The advantages claimed for this method of lubrication are that the required amount of lubricant is contained in each tube and that the lubricant is of the correct consistency. It is free from gritty or corrosive substances and the method of introducing it to the bearing housing by means of the tube prevents outside dirt from being carried in with it.

— 224 —

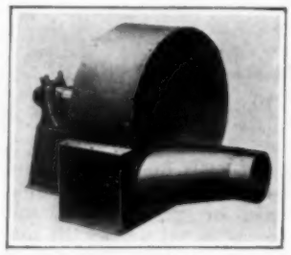
Fans, Exhaust

Connecticut Blower Corporation, Hartford, Conn. [Vol. 64,p.580.]

The exhaust fan illustrated is for conveying finely divided materials by air.

The inlet is placed near the periphery of the rotor and adjacent to the outlet. A flare in the inlet pipe toward the discharge opening is also provided. The material conveyed by the air is discharged immediately without being passed through the wheel and around the casing.

Each wheel contains 16 blades riveted to a heavy hub.



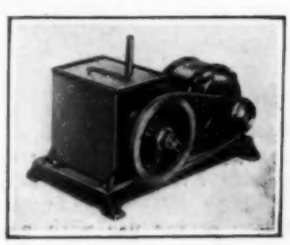
The fans are constructed almost entirely of steel. The belt-driven models are equipped with double-row, self-aligning ball bearings. Direct-connected motor types may also be obtained. The fans are made in eleven sizes, either single or double, with inlet diameters ranging from 9 to 33 in. The smallest single-rotor fan weighs 220 lb., while the largest double-rotor fan weighs 2,200 lb. The fans are reversible and the inlet and discharge connections may be arranged in various positions.

— 225 —

Pump, High-Vacuum, "Midget"

Eisler Engineering Co., 756 *South Thirteenth St., Newark, N. J.* [Vol.64,p.657.]

The "Midget" single- and two-stage high-vacuum pump is for laboratory use. The pump, illustrated, is of the rotary type with the moving element placed eccentric to the fixed casing, which is



larger in diameter. The two-stage unit without backing will exhaust to an absolute pressure of 0.001 mm. of mercury. A greater degree of vacuum may be obtained by backing the two-stage pump with the single-stage unit. The entire pump is immersed in oil.

The pump is belted to a motor mounted on the same base. It operates at a speed of 425 r.p.m. and requires $\frac{1}{4}$ hp. for the single-stage unit and $\frac{1}{3}$ hp. for the compound. The overall dimensions of the complete unit, including the motor, are 11x17x10 in., and the weight is 70 lb. The pump itself weighs 32 pounds.

— 226 —

Pump, Vacuum, Combination

Eisler Engineering Co., Inc., 756 South Thirteenth St., Newark, N. J. [Vol.64, p.963.]

The combination vacuum pump shown in the accompanying illustration is intended for radio tube and lamp exhausting or for purposes where a high vacuum is necessary.

The pump is connected with an oil trap and tubing as shown. The tube to the left can be connected to whatever is to be exhausted with a pinch cock in its line. The right-hand tube is also connected to the exhausting manifold with a pinch cock. After the pump is started the right-hand pinch cock is

closed and the other is opened. Pump No. 2 is the compound pump which does the preliminary exhausting. After a few minutes the right-hand pinch cock is opened and the other is closed. The single-stage pump No. 1 is the finishing pump, and pump No. 2 acts as the backer to the former when exhausting. A shut-off valve is provided for the tube to the right.

It is claimed that a vacuum reading of 0.00015

mm. on a McLeod gage can be secured. The pump can be had for belt drive or it can be mounted as a unit with a ½-hp., 500-r.p.m. motor. It occupies a floor space of 14x16 in. and stands 12 in. high. The pulley-driven pump weighs 175 pounds.

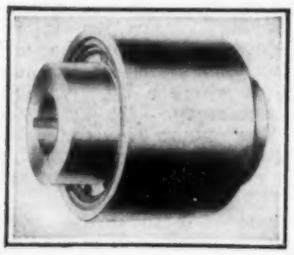
— 227 —

Coupling, Flexible

Clark Controller Co., Cleveland, Ohio. [Vol.64,p.879.]

The flexible coupling shown in the accompanying illustration is intended for application to any direct-connected load including fractional horsepower drives as well as heavy-duty requirements.

The couplings consist essentially of three pieces: a sleeve and two abutting hubs. The hubs each have four teeth on their circumference and the sleeve which



extends over the two hubs has four teeth facing inward to mesh with the teeth of the hubs. Eight packing strips are inserted between the teeth of the sleeve and the hub so as to provide a cushioning effect. The sleeve is held over the hubs by means of keeper and spring retaining rings.

The couplings are made in eleven sizes with bores from ⅝ to 6 in. in diam. for a maximum horsepower service at 100 r.p.m. of from ½ to 100. The two smaller sizes are made from bronze, but the others can be had in either cast iron or cast steel.

— 228 —

Coupling, Shaft, "Flexoid"

Smith Power Transmission Co., 1218 *Ontario St., Cleveland, Ohio.* [Vol.64,p.1001.]

A flexible shaft coupling, known under the name "Flexoid," has been placed on the market. The coupling consists of two cast-iron flanges coupled together with one or more flexible fabric disks in such a manner that

there are no metal-to-metal bearing surfaces.

The joint is designed to permit a 6-deg. misalignment of the shafts and requires no lubrication. The fabric is specially treated, and is impervious to oil and water. The couplings are made in eight sizes with capacities of from 2 to 100 hp. at 1,000 revolutions per minute.

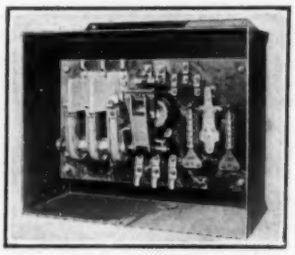
— 229 —

Starter, Thermaload

Monitor Controller Co., Baltimore, Md. [Vol.64,p.38.]

The thermaload starter illustrated is for use with any type of drive where single-phase or polyphase motors are connected across the line. The starters give low-voltage and overload protection, and also protection from damage due to phase failure. They will permit full-load full-torque starting.

Two types of the starters are manufactured, one has a self-resisting thermal relay and is used with the three-wire, momentary-contact control circuits. The second type has the relay arranged for manual reset and



can be used either with two-wire maintained-contact or with three-wire momentary-contact pilot-circuit controls.

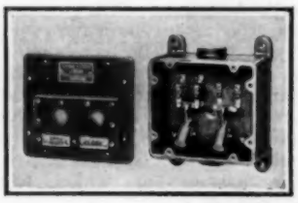
The thermal expansion units are of metal. The thermal or heating units of various ratings are interchangeable enabling a starter to be transferred from one horsepower rating to another.

— 230 —

Switch, Push-Button, Dust-Tight

General Electric Co., Schenectady, N.Y. [Vol.64,p.181.]

This special push-button station is for use with a.c. magnetic starting switches. The station unit has a cast-iron case with a flexible leather gasket over the buttons. Each button is operated by pressing on the leather directly over it. The leather can be kept flexible by occasional applications of neatsfoot oil. The station can



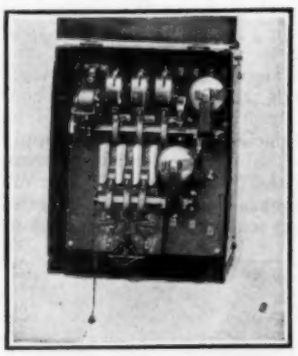
be mounted either vertically or horizontally. It was originally designed for marine use where subject to a spray or a damp atmosphere which will corrode the unit.

— 231 —

Resistance Starters, Improved

General Electric Co., Schenectady, N.Y. [Vol.64,p.221.]

The primary resistance starters, for squirrel-cage induction motors, bearing the designation CR-7056-D-1, have been superseded by two



improved types, the CR-7056-D-3, illustrated, produced in sizes for use on motors up to 25 hp., and the CR-7056-D-4 for motors of from 25 to 50 hp. The former has arc barriers and the latter is equipped with magnetic blowouts and arc chutes to handle the larger motor currents. Both starters have an improved magnetic time interlock.

They have been redesigned to conform to Classification No. 16 of the Electric Power Club, which provides for 200 per cent full load current or more on the first point for 15 sec. out of every four minutes.

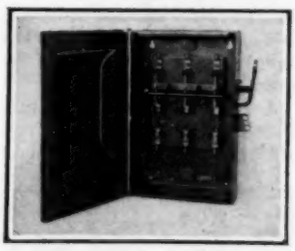
Both models are arranged for wall mounting and weigh approximately 122 pounds.

— 232 —

Switch, Quick-Break, Type WK-62

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.64, p.260.]

The type WK-62 quick-break, industrial safety switch, illustrated, is externally operated and totally inclosed. Knock-out disks are provided in the back, sides and bottom of the box for any desired arrangement of the conduit. The diamond pointed jaw and the extended blade are used in this model, so that any burning that occurs when the switch is opened, does not foul the cur-



rent-carrying area of the blades.

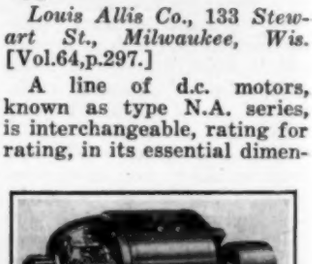
The switch is supplied in capacities of from 30 to 200 amp. and is rated at 250 volts d.c. or 250 to 500 volts, a.c., in both fusible and non-fusible types.

— 233 —

Motors, Direct-Current, Type N.A.

Louis Allis Co., 133 *Stewart St., Milwaukee, Wis.* [Vol.64,p.297.]

A line of d.c. motors, known as type N.A. series, is interchangeable, rating for rating, in its essential dimen-



sions with the line of polyphase motors manufactured by this company and previously described on page 205, Vol. 85, of the *American Machinist.*

The motor has a 40-deg. rating with heavy overload capacity and is for general-purpose work. Ventilation is provided throughout the windings to insure coolness. Ring-oiled sleeve bearings

are used, and the bearing chamber is designed to hold a large quantity of oil to make frequent renewals unnecessary. The bearing inspection opening is closed by means of a dust-tight removable cover.

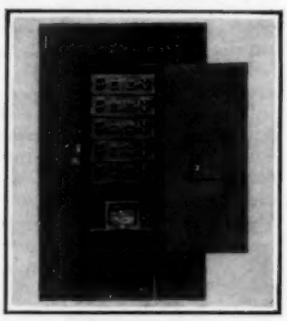
— 234 —

Switch, Panelboard

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.64, p.297.]

A line of industrial panelboards for the control of lighting systems in offices and factories has been placed on the market. These panelboards are made in sizes supplying from 4 to 32 circuits and in capacities ranging from 30 to 100 amperes. They are constructed with two doors, one within the other. The smaller door, giving access to the switch compartment, has a snap catch; the larger one, opening into the fuses, is equipped with a Yale lock.

The panelboards are built up in units of single or double-pull switches built on composition bases. The units



may be easily removed, making inspection and replacement easy.

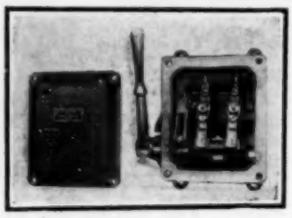
The cabinet fronts of these panelboards are equipped with the Westinghouse standard trim clamp that allows an adjustment up to ¾ of an inch in depth and in lateral adjustment.

— 235 —

Switch, Water-Tight, Remote-Control

Cutler-Hammer Manufacturing Co., Milwaukee, Wis. [Vol.64,p.297.]

The remote-control switch, illustrated, has been designed for use in the presence of moisture and acid fumes. The mechanism is inclosed in a cast-iron case which has a cover fitted with a gasket. A stuffing gland fitted to the shaft provides a tight joint and the thick wall of the



cast-iron body allows enough threads for a tight conduit or pipe connection. The case is sprayed with a protecting paint to withstand submersion in water and the effect of acid fumes. The model illustrated is of the two-wire type. It will handle all industrial voltages.

— 236 —

Motors, Synchronous

General Electric Co., Schenectady, N. Y. [Vol.64, p.339.]

A line of synchronous motors for general-purpose work is being marketed by this company. The motors are intended to drive any load of which the torque requirements have been heretofore met with a standard squirrel-cage induction motor. They are of the G. E. types TS and QS, and are known as the 7,500 series.

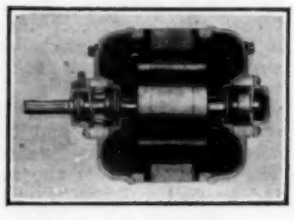
The motors meet all the Electric Power Club requirements for a general purpose motor. The ratings range from 20 to 150 hp. with speeds of 1,200, 900, 720 and 600 r.p.m. at 60 cycles. The motors are rated at 40 deg. continuous, at unity power factor. At 90 per cent or 80 per cent power factor, the temperature of the stator will not exceed 40 deg., with 50 deg. on the rotor.

— 237 —

Motors, Automatic Rotor Re-centering

Howell Electric Motors Co., Howell, Mich. [Vol.64,p.459.]

In order to insure a uniform air gap at all times in motors, the above company has introduced a complete line of motors equipped with anti-friction bearings that are used in conjunction with a device to keep the rotor automatically centered.



The bearings are standard Timken tapered roller bearings. The inner race is fitted on the shaft with a light press fit and the outer race slips into the housing of the motor end bell with a sucking fit. Behind the outer race is placed a fluted wire spring, which is held in compression by the end cover. Thus a continuous thrust is placed upon the bearing. The manufacturers claim that this spring automatically takes up any wear, since the bearings are tight at all times; that the spring permits lateral expansion of the shaft due to heat without setting up a high internal thrust; that the bearings run more quietly; and that the rotor is centered at all times.

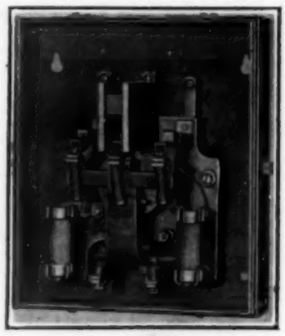
The bearings are arranged for grease lubrication, and protection against the intrusion of dirt and the loss of the lubricant is assured by labyrinth seals. The motors can be mounted either vertically or horizontally.

— 238 —

Starters, Across-the-Line

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.64, p.499.]

A reversing and non-reversing type of starter is being made by the above company. The reversing type, class 11-165 has a mechanical interlock that makes it impossible to close



both contactors at the same time. The non-reversing starters, class 11-160, are applicable for use in textile mills, on machine tools, woodworking machinery, and the like.

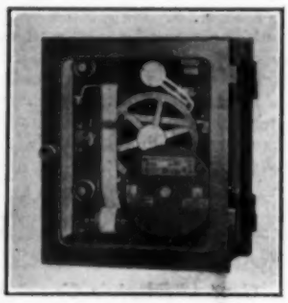
Both units are mounted in place in steel cabinets by means of two screws. The starter proper consists of a 3-pole contactor of the floating armature type with an electrical interlock. The contactor tips are kept clean by a rolling and wiping action in closing that reduces the tendency to heat or weld under load. The starters are completely inclosed and are operated entirely from a push-button station. A door interlock can be provided that makes it impossible to start the motor unless the cabinet door is fully closed.

— 239 —

Meter, Demand, Type PD

General Electric Co., Schenectady, N. Y. [Vol.64, p.432.]

The type PD demand meter manufactured by the above company prints directly the demand for each interval since the printing wheel returns to zero at the end of each interval. The figures are printed on a narrow paper tape that is graduated in time. A strip of the tape



is visible at all times so that the record for a considerable number of preceding intervals is always in view.

Other features are three extra dials or indices. One shows the maximum demand that the meter has recorded since it was last manually reset; the second shows the number beneath the printing platen at that time, and the third dial registers the total number of contacts delivered to the demand meter. The latter provides a means of verifying the registration of the demand meter by comparing it with the watt-hour meter register with which it is coupled.

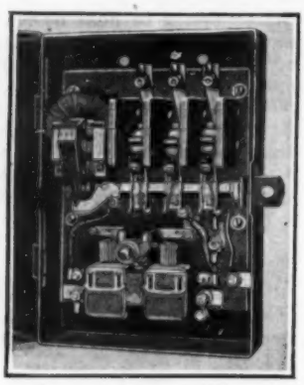
— 240 —

Starter, Across-the-Line

Cutler-Hammer Manufacturing Co., Milwaukee, Wis. [Vol.64,p.656.]

The automatic starter illustrated is for use in connection with a.c. motor drives of small and medium capacities. It can be connected directly across the line, where complete motor protection is desired. It is designed to provide for a modern thermal overload relay and low-loss magnet construction.

The starter is fully in-



closed and employs a positive acting three-pole contactor, together with a thermal overload relay. It can be adjusted to individual motor loads. After the switch has been tripped by an overload it is reset by pressing a button. The contact fingers employed are accessible for inspection without the use of tools, and can be removed without taking the starter from the case.

It can be adapted to varying ampere ratings by using the proper heating coils for each rating.

— 241 —

Switch, Master

General Electric Co., Schenectady, N. Y. [Vol.64, p.656.]

The lever-operated master switch illustrated is for steel mill service or other work where strength and durability are needed. The switch is suitable for grouping and for

operation by one man. It has been assigned the designation C-3003 in the CR-3012 series of control.

The switch consists of a cast-iron frame and cover that totally inclose the contact mechanism. The handle is of the vertical type and operates through a radius of 40 deg. on the one-point switch and through a 100-deg. radius on the three-point switch. The handle is held in the "off" position by a spring roller device.

— 242 —

Panel, Control, Two-Speed

General Electric Co., Schenectady, N.Y. [Vol.64,p.733.]

The control panel, illustrated, is for use with two-speed motors for driving baking machinery or machine tools. It bears the designation CR-7107-H-1. The device consists of two contactors mounted back-to-back, one contactor having four poles and the other six. One pole of each contactor is used as a holding interlock. A temperature overload relay is connected to each contactor, that gives protection to the motor at either speed.

A special push-button station for use with the new panel on baking service has "mushroom" heads on each button.

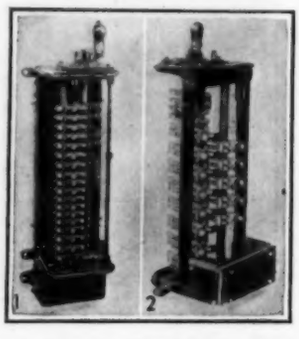
— 243 —

Controllers, Drum

General Electric Co., Schenectady, N.Y. [Vol.64,p.734.]

A standardized line of drum controllers for general purpose, crane hoist and machine tool application is being marketed for use with either direct or alternating current. The smaller sizes are for wall mounting; the larger sizes for floor mounting, as shown in Figs. 1 and 2, respectively.

The frame of the controllers is of the built-up skeleton type and consists of cast-iron cap and bed plates to which are riveted rectangular steel bars. This construction is said to make the



switch accessible from both back and front for the purpose of making adjustments and renewals.

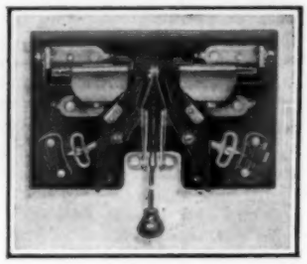
Improved self-aligning contact fingers are used. Removable copper tips are standardized for all switches of the same capacity. Where cross-arcing is likely to occur, preventative barriers and blowouts are provided. Auxiliary contact fingers for control circuits to the line protective switch are also provided.

— 244 —

Relay, Overload, Improved

General Electric Co., Schenectady, N.Y. [Vol.64,p.770.]

The improved relay, illustrated, is the form C and is designated as the TC-121-C relay. The device has two heating elements which are



removable. For single-phase a.c. circuits and for d.c. circuits the heating elements are connected in each side of the line. For 2-phase a.c. circuit an element is connected in each phase, while for 3-phase a.c. circuits the elements are connected in two of the phases.

The mechanical construction has been improved and the design is said to be such that the bending of the thermostat strips by the operator is prevented. The relay is reset by means of a cord with a button at the bottom.

— 245 —

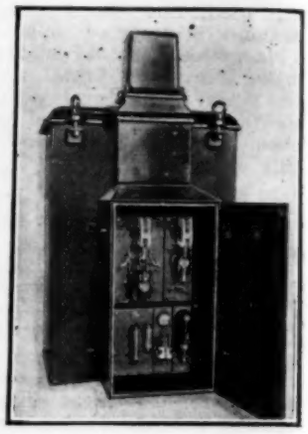
Controller, Synchronous-Motor

Electric Controller & Manufacturing Co., Cleveland, Ohio. [Vol.64,p.840.]

A self-contained, oil-immersed automatic control for 2,300-volt synchronous motors has been brought out both for across-the-line starting of low-speed motors, and for reduced-voltage starting of higher speed motors. The reduced-voltage starter is illustrated. The control for full voltage is similar, but of slightly less height.

To start the motor with the control, the operator pushes a button, and as the motor reaches synchronous speed, the field excitation is automatically applied.

The reduced voltage control has an automatic double-throw switching mechanism, a power transformer for starting, and potential transformers for providing 220 volts for the master-switch operating current and the current transition relays. The latter connects the motor to full voltage when it



has been accelerated to about 85 per cent of synchronous speed. The full voltage control is similar to the reduced voltage control, except that the starting transformer is omitted.

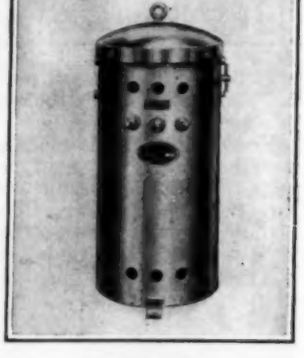
— 246 —

Controller for Electric Arc Welders, "Mann"

Electric Welder Controller Co., 602 Bigelow Blvd., Pittsburgh, Pa. [Vol.64,p.921.]

The "Mann" master controller, illustrated, is said to prevent spattering when a small globule of metal momentarily short circuits the arc.

The controller consists of a combined choke and reactance coil. This unit can be introduced directly into a 35-volt circuit of constant potential



without the use of additional resistance units. The resistance drop when 300 amp. are flowing is two volts. The electrode can be held in contact with the work from one-tenth to one-eighth of a second before the current rises above 300 amp. Hence the current does not rise abnormally when a globule of metal momentarily short circuits the arc.

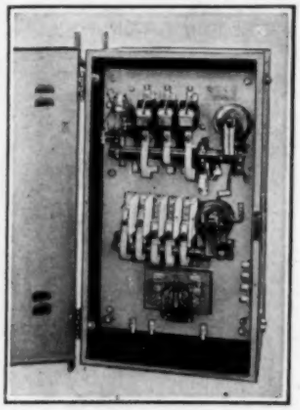
The controller weighs 420 lb. ready for shipment.

— 247 —

Starter, Reversing, for Squirrel Cage Motors

General Electric Co., Schenectady, N.Y. [Vol.64,p.926.]

The reversing starter of the primary type illustrated is for use with squirrel-cage induction motors. Two three-hole line contactors are provided that are electrically and mechanically interlocked and are mounted back-to-back on the panel. A magnetic interlock provides a predetermined definite time ranging from one to three seconds between



the closing of the line contactor and the accelerating contactor.

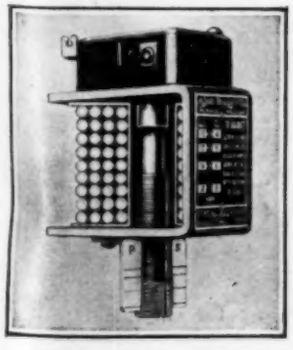
Two-point starting is provided by a resistor, while a temperature overload relay furnishes overload protection. The inclosing case is made of sheet metal and is semi-ventilated. It is provided with feet for wall mounting. There are doors at both the front and the back of the panel that can be locked. When mounted, the panel occupies a position at right angles to the wall.

— 248 —

Relay, "Inducto-Therm"

Allen-Bradley Co., 286 *Greenfield Ave., Milwaukee, Wis.* [Vol.64,p.928.]

The thermal relay illustrated is to be used as the protective unit on some of the standard a.c. switches



and starters of this company.

The contact mechanism is maintained in a closed position by means of a reset lever which engages with a ratchet wheel that is soldered to the vertical pin of the copper thermal element.

If the current flowing through the relay exceeds a predetermined maximum, the magnetic flux in the core becomes sufficiently dense to heat the copper thermal element and to melt the solder which holds the ratchet wheel. The ratchet wheel then turns and opens the relay contacts. As soon as the motor current is interrupted, the thermal element cools and the solder automatically sets, holding the ratchet wheel, and ready to repeat its performance.

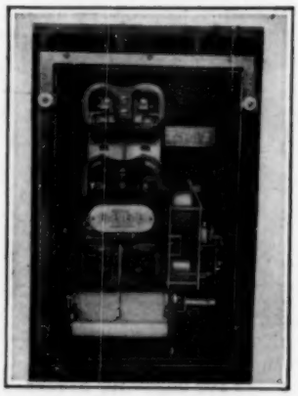
The adjustable magnetic core can be raised or lowered according to the scale beside it so as to vary the current at which the relay will trip and can be adjusted over a range as from 1 to 5 hp. for a given voltage.

— 249 —

Meter, Demand, Three-Element, Type RA

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.64,p. 962.]

The three-element demand meter, type RA, is for use with 3-phase, 4-wire circuits.



Three elements are necessary to correctly meter such circuits under unbalanced voltage or load conditions in accordance with Blondel's rule that $(n - 1)$ wattmeter elements are necessary for a circuit of n wires.

— 250 —

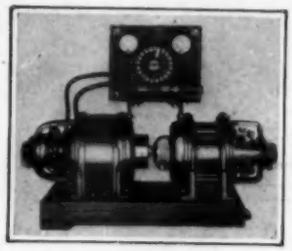
Charger Battery Constant-Potential

Joseph Weidenhoff, 4352 *West Roosevelt Rd., Chicago, Ill.* [Vol.64,p.963]

Four sizes of constant-potential battery chargers have been placed on the market.

The General Electric motor and generator are both mounted on a single base. The arrangement permits the use of a solid coupling between the motor and the generator. Standard sleeve bearings are used and the armature can oscillate. A three-bearing construction is adopted.

Its compensating-pole design is claimed to keep the voltage constant under all load conditions from no load up to 25 per cent overload



within a fraction of 1/10 of a volt.

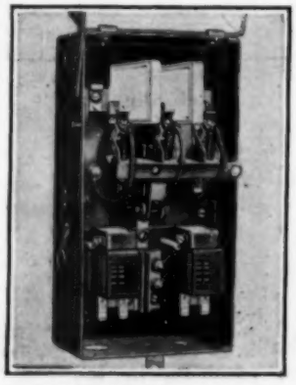
The No. 50 unit has a 100-amp., 7½-volt generator, direct-connected to a 1½-hp. motor and a 10-circuit, 3-bus bar charging panel. The No. 55 is for 100-amp., 15-volt, or for 200-amp., 7½-volt service. It has two 100-amp., 7½-volt generators, connected at each end to a 3-hp. motor. A 20-circuit, 3-bus bar, charging panel is furnished. A similar panel is supplied with the No. 60 unit which has a 200-amp. 7½-volt generator direct-connected to a 3-hp. motor. The model No. 65 machine is for 400-amp., 7½-volt, or for 200-amp., 15-volt service. Two 200-amp. 7½-volt generators are direct-connected to a 5-hp. motor. The unit is equipped with a 40-circuit, 3-bus bar, panel.

— 251 —

Switches, Across-the-Line

Allen-Bradley Co., 286 *Greenfield Ave., Milwaukee, Wis.* [Vol.64,p.1002.]

The across-the-line switch shown in the accompanying illustration has been de-



signed to include the "Inducto-therm" relays previously described on page 928, Vol. 64, of the *American Machinist.*

The improved switch is smilar to the across-the-line switches that have been equipped with thermal relays. The use of the improved relays provides interchangeable thermal elements which will adapt the switch to a wide range of horsepower by simply changing the position of the core in the relay by means of an adjusting screw.

— 252 —

Oil Burner and Preheater

Alexander Milburn Co., 1416-1428 *West Baltimore St., Baltimore, Md.* [Vol.64, p.35.]

The oil burner and preheater illustrated is intended for pre-heating castings before welding, for heating soldering irons or to serve as burners for core ovens or annealing furnaces.

The burner is of the atomizing type and uses kerosene oil or distillate as a fuel. The equipment is provided with

an air supply line. The air is maintained in the tank under a pressure varying from 50 to 100 lb. and a direct flow of air to the burner is supplied, as well as pressure to the oil storage tank.

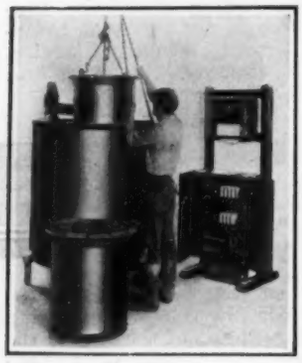
— 253 —

Furnace Equipment for Drawing, "Homo"

Leeds & Northrup Co., 4901 *Stenton Ave., Philadelphia, Pa.* [Vol.64,p.298.]

The "Homo" electric furnace and accessories are for drawing purposes. The equipment includes the furnace, top baskets for holding the work, a single-point recording potentiometer controller and an automatic control panel that varies the current input to maintain an even temperature.

The furnace is of the forced convection type and uses air as its medium. To



secure uniformity of temperature, the circulation of air through the furnace is reversed at short intervals. The basket is shielded from the electrical heating coils so that the heat transmitted will be by convection and not by radiation.

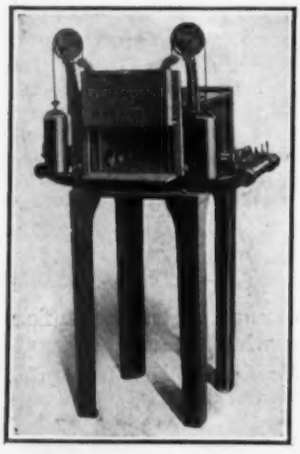
The equipment can be furnished for operation on 110- or 220-volt a.c. or d.c. current, and the furnaces are made in two sizes to accommodate baskets 14 in. in diam. by 16 in. deep and 20 in. in diam. by 26 in. deep.

— 254 —

Furnace, Oven, No. 700

Johnson Gas Appliance Co., Cedar Rapids, Iowa. [Vol. 64,p.540.]

An atmospheric type of gas oven furnace for heat-treating small parts is illustrated. Six direct-jet Bunsen-type burners supply the heat to the furnace without the use of a forced air blast.



Temperatures as high as 2,350 deg. F. have been claimed. Each burner can be controlled independently of the other.

The fire box measures 7x11x14 in. inside the lining of heavy fire brick. A balanced door makes charging easy. Heating small parts for hardening, annealing, and carbonizing can be carried on economically.

— 255 —

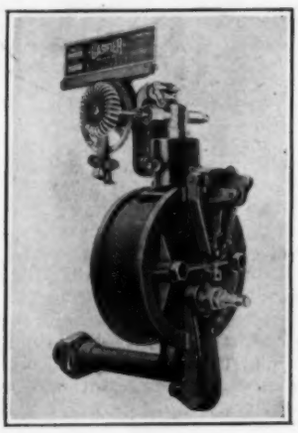
"Gasifier"

Socony Burner Corporation, 26 Broadway, New York, N. Y. [Vol.64,p.617.]

The Socony Gasifier is for use on industrial heating appliances. It has an adjustable flame and one gasifier can be used to operate several burners.

It is adjustable for the use of any grade of oil from distillate fuel oil up to kerosene. The fuel is supplied by a small pump or by gravity, the pressure required being 3 pounds.

Oil and air are introduced into a fixation chamber, the



entry being controlled by means of a hand-operated proportioning valve. The oil is atomized under low pressure and injected into another chamber where almost flameless combustion is maintained. The high temperature of the gases in this chamber vaporizes the balance of the oil and it is discharged in the form of a mixture of fixed gas saturated with oil vapor.

After the primary ignition with a high tension spark the gasifying chamber sustains its combusion by the use of special alloy metal fingers in the path of the flame.

Two units of capacity, F-1 and F-5 are made. The size F-1 weighs 15 lb. and measures about 8x2 in. while the F-5 weighs 40 lb. and measures about 15x3 inches.

— 256 —

Marking Machine, Level-Graduating

Noble & Westbrook Manufacturing Co., 19 Asylum St., Hartford, Conn. [Vol.64,p. 38.]

The machine illustrated graduates the face and marks the numbers, in the same

operation, on a two-foot aluminum level. The special table is moved by means of a handle through a rack and pinion arrangement. The circular die under which the work is pressed is 12 in. in circumference and it passes over the work twice.

Pressure of the die on the work is secured by means of a spring and is released by pressing the treadle. The work is inserted in the gages.

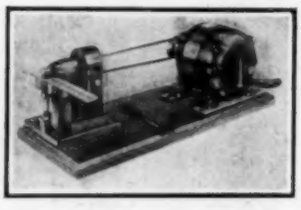
— 257 —

Marking Machine

Noble & Westbrook Mfg. Co., 19 Asylum St., Hartford, Conn. [Vol.64,p.258.]

The machine, illustrated, is for marking gold solder with a continuous mark that designates the grade of solder. A ¼-hp. motor driving through a worm gear and a V-pulley is used.

The solder is fed between marking rolls, the top one of



which is lettered and the bottom one of which is grooved to carry the stock. Provision is made for carrying different thicknesses of material. The machine runs continuously as the stock is fed into it. The weight, including the motor, is about 30 pounds.

— 258 —

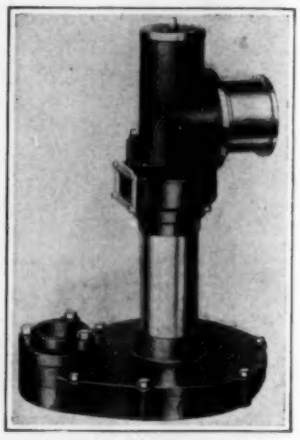
Pump, Reversible, Belt-Driven, Model BL, "Gusher"

Ruthman Machinery Co., Cincinnati, Ohio. [Vol.64,p. 537.]

A belt-driven pump of large capacity has been added to the line of "Gusher" machine tool lubricating pumps. The model BL, illustrated, handles 53 gal. per min. at a 4-ft. head and 400 r.p.m. The model TL, a smaller size, delivers 20 gal. per minute.

Both the horizontal countershaft carrying the pulley and the vertical pump shaft are mounted on deep groove ball bearings. Lubrication of the gears and bearings is provided for by means of an auxiliary centrifugal pump.

The impeller of the pump is so constructed that the liquid pumped cannot rise into the shaft housing whether the flow is throttled or not. Each compartment is open to the outside of the impeller by means of holes in the circumference. The lower and



principal part of the impeller has radial blades, open on the lower side, that are smaller in diameter than the upper auxiliary blades. As a result, the pumping effect of the auxiliary blades exceeds that of the main pump and an effective seal is created.

The clearances on the main impeller are such that interference by small chips and abrasive matter is avoided.

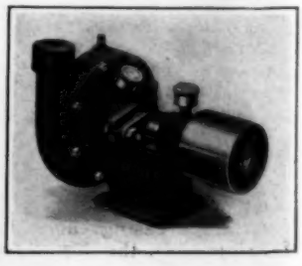
— 259 —

Pump, Coolant, Centrifugal

Goulds Pumps, Inc., Seneca Falls, N. Y. [Vol.64,p.842.]

The small centrifugal pump illustrated is for handling the cooling compound for machine tools.

The design is such that it will pass chips without clog-



ging or undue wear. The casing is bolted to the frame with eight studs, and by shifting the casing with respect to the frame the discharge can be placed in any one of eight directions. The pump itself will operate in any position and is driven by means of an overhung pulley and belt. A bronze bushing carries the thrust load.

The rated capacity is 20 gal. per min. at a pressure of 9 lb. per sq.in. when the pump is operating at 1,750 rev. per minute.

— 260 —

Speed Reducer, Type 2

Winfield H. Smith, Springville, Erie Co., N. Y. [Vol. 64,p.181.]

The improved type 2, speed reducer, illustrated, retains the same center distances, shaft sizes and shaft extensions, as the former model. The unit is equipped with bronze-bushed bearings for the high-speed shaft. The gear case provides for a

greater oil capacity and is more rigid in construction than the former model.

Gear reductions of 48 to 1 or 30 to 1 can be had. The unit is regularly equipped with a 5-in. grooved pulley on the drive shaft and four-step grooved pulleys of 1, 1¼, 2 and 2½ in. on the driven shaft.

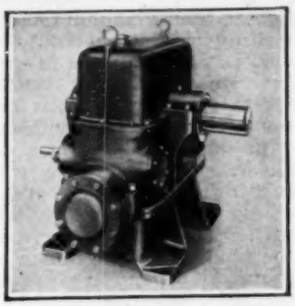
— 261 —

Speed Reducers, Two-Worm

DeLaval Steam Turbine Co., Trenton, N. J. [Vol.64, p.260.]

The two-step worm reduction gear, illustrated, has been developed to provide ratios ranging from 100 to 1, to 8,000 to 1. The unit is designed for driving cooling tables, conveyors, stokers, heat-treating furnaces, escalators or similar devices. The gearing consists of an initial worm turning a wheel mounted on the end of a shaft that carries a second worm, which drives the low-speed wheel.

A single casing carries all bearings for the high-speed



worm shaft and the low-speed worm shaft. The construction is rugged to enable the use of the unit for heavy-duty work. Flexible couplings of the pin and rubber bushing type are provided.

The casing serves as a reservoir, from which a pump draws oil that is forced through passages to the low speed shaft bearings. A packing gland prevents the escape of oil along the high speed worm shaft, while an oil flinger prevents seepage along the low-speed shaft.

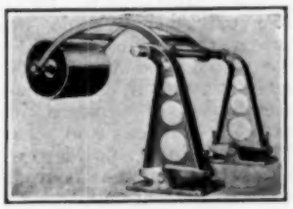
— 262 —

Stand, Tilting, Idler-Pulley

Harry M. Perry, 702 North Main St., Los Angeles, Calif. [Vol.64,p.499.]

The tilting stand illustrated is for use in connection with the "Beltslacker" made by the same company. The "Beltslacker," or idler pulley, is carried by means of a pulley bracket hinged at the top of the tilting stand. The tension on the slack belt is secured by the weight of the pulley and the arms.

Each stand consists of a base and a triangular tilting



arm, pivoted at the center of its base. At each lower corner is a set screw provided with a locking nut. Movement of the stand regulates the distance between the idler pulley and the main driving pulley so that the idler pulley will be in a position where the belt on each side of it will be at the same angle from the vertical so as to avoid push or pull horizontally on the hinged bar. A belt can also be lead over sideways in either direction, where desired, by tilting the stands with respect to each other.

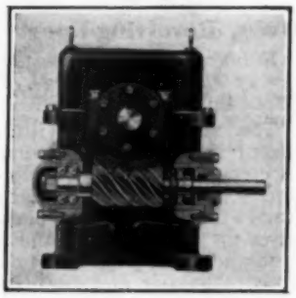
For narrow belts a single stand can be used and the pulley bracket can then be bridged over the upper end of the stand.

— 263 —

Speed Reducers, Worm Gear

Horsburgh & Scott Co., Cleveland, Ohio. [Vol.64,p. 691.]

Three types of worm gear speed reducers have been placed on the market by this company. The type B which is shown in the accompanying illustration has the worm below the gear, the type T has the worm above the gear, and the type V reducer has the gear shaft in a vertical position. The single reduction units are intended for ratios up to 100 to 1.



Double reduction units are also manufactured for ratios of 3,000 to 1 and over.

The worm shaft is mounted on ball bearings. The rear bearing is of the duplex radial-thrust type, and the front bearing is of the straight radial type.

Three types of mounting are provided for the worm gear shaft. Where the load on the shaft is principally torque, and is transmitted through flexible couplings or where an outboard bearing is used, lighter shafts mounted on ball bearings are furnished. Where the load is torque with a light suspended load, roller or journal bearings can be adopted, but heavy bronze journal bearings and large-diameter shafts are supplied for heavy overhung loads.

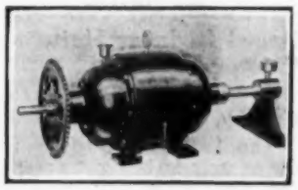
The point of contact between the worm and the gear is flood lubricated.

— 264 —

Transmission, Variable Speed, "JFS"

Columbia Vari-Speed Co., 4020 West Lake St., Chicago, Ill. [Vol.64,p.920.]

The "JFS" variable-speed transmission consists of a special form of roller bearing with a constant-speed input shaft rotating on the inner races of the bearing. The outer races are held from rotating, but are moved axially as the speed control wheel on the left of the frame is turned. In this way the points of contact of the rollers and races are shifted, and variation of the speed is effected.



The pressure between the rollers and races is supplied by springs, and is somewhat less than that of plain roller bearings.

The transmission acts as both a speed reducer and a clutch. While the constant-speed shaft continues to run, the variable-speed shaft can be started or stopped under full load by the same hand-wheel that regulates the speed. The unit is manufactured in eight standard sizes of from ¼ to 7½ hp. The sizes up to ¾ hp. weigh 90 lb.; from 1 to 3 hp., 185 lb.; and from 5 to 7½ hp., 325 pounds.

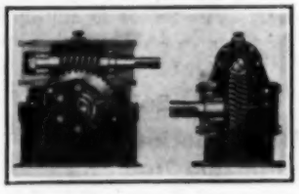
— 265 —

Speed Reducers, Worm-Gear

William Ganschow Co., 1011 West Washington Blvd., Chicago, Ill. [Vol.64,p.997.]

The fully inclosed worm-gear speed reducer illustrated has been placed on the market.

The standard units are equipped with special bronze gears. The smaller units have a solid bronze gear and



larger units have a bronze rim shrunk and studded on a cast iron center.

The material from which the worms are made is 3½ per cent nickel steel, S.A.E. No. 2320. The case on the worm threads has a Scleroscope hardness of from 80 to 85. The worm and threads are ground. The pressure angle of the worm thread is 22½ deg. on the axial section.

Anti-friction thrust bear-

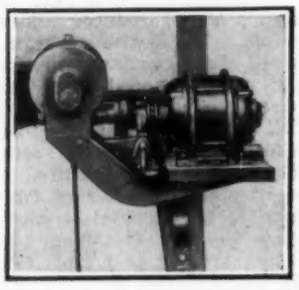
ings are used throughout. Either ball or roller bearings can be fitted to the units. The gear bearings are held in place by means of clamping plates, as is the duplex worm thrust bearing. The front radial worm bearing is free to float to compensate for expansion due to the heat.

— 266 —

Speed Reducer Unit, "Motor-It"

Utility Manufacturing Co., Cudahy, Wis. [Vol.64,p.998.]

The "Motor-It" speed reducer unit is being marketed for use with any type of small machine. The unit has a disk clutch operated by means of a foot lever and is intended for short intermittent operation. For longer



intermittent operation an expanding-type clutch is furnished, while for an electrically controlled machine a flexible coupling is used.

The motor runs at 1,800 r.p.m. and any speed reduction desired can be specified. The reduction is made by means of a worm and wheel or spiral gears. Roller or ball thrust bearings are used. These units can be applied to any type of machine now driven by means of a belt or gear.

The unit is furnished with motor, clutch, and reduction gear. The motor is supplied in ¼-, ½-, ¾-, 1-, 1½- and 2-hp. sizes.

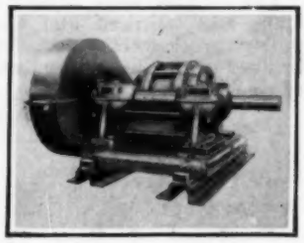
— 267 —

Drive, Back-Geared, Induction-Motor

General Electric Co., Schenectady, N. Y. [Vol.64,p. 1003.]

A back-geared attachment designed for use with its Series 500 induction motors has been placed on the market by this company.

The base to which the motor and the back-shaft pedestals are bolted and doweled is a single, large casting. A special unit type pedestal is used, one casting forming the housings for the large



back-shaft bearings. The back shaft is provided with shoulders to limit end play and is made of special steel.

A split gear case, fabricated from steel plates, protects the gear and pinions from dust and retains the grease or oil in which the gear runs. Two standard gear ratios are available. Steel or fabroil pinions with cast-iron gears can be used.

— 268 —

Oven, Revolving-Door

Skinner Bros. Manufacturing Co., Elizabeth, N. J. [Vol.64,p.37.]

The revolving door illustrated is built for operation in connection with gas, electricity, oil and steam heating units for baking temperatures up to 650 deg. F. and it is intended for japan, enamel or core baking and for drying.

When a rack has been filled with loaded grids the door is swung on pivots and

the finished side is exposed for unloading. The heat is applied by the indirect method.

Ventilation is secured by means of an exhauster that draws the air through pipes in the combustion chamber where it is preheated before entering the baking chamber.

— 269 —

"Beryllium"

Beryllium Corporation of America, 5005 Euclid Ave., Cleveland, Ohio. [Vol.64,p. 217.]

The physical characteristics, claimed for the alloy "Beryllium" are a weight ⅓ lighter than aluminum and a melting point of about 1,275 deg. C. It is for use in conjunction with other metals where special properties are sought. It can be combined with aluminum, copper or silver. With aluminum, it is said to form a series of alloys of high melting point. It is used with copper to increase the tenacity and hardness of bronze alloys and to give special color effect.

— 270 —

Fire Stopper, "Rego"

Bastian-Blessing Co., 240 E. Ontario St., Chicago, Ill. [Vol.64,p.218.]

The "Rego" fire stopper of which model 4-11-44 is illustrated, is intended for

garages, power stations, industrial plants or private buildings.

The extinguisher is composed essentially of two parts, a cylinder to hold compressed carbonic acid gas and a cone to be filled with powder. When released a stream of gas and powder is projected through a nozzle. The original carbonic acid has a smothering effect on the flame and the powder, when it comes in contact with the flame, decomposes into carbonic acid gas and steam. The remaining powder will blanket the flame as would sand.

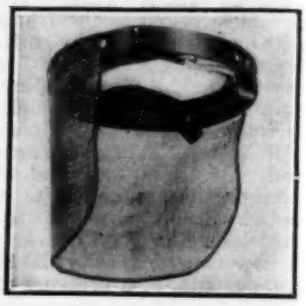
The capacity of the cone is 2 gal. or 17 lb. of powder and the total weight of the apparatus, when charged, is 32 pounds.

— 271 —

Head Mask for Forge Shops

Sherman Corporation, 2 Rector St., New York, N. Y. [Vol.64,p.258.]

The head mask, illustrated, has been designed for use in forge shops where the spray of chips, sparks and bits of slag is toward the face. For convenience, the mask is



equipped with an elastic head-band so that it can be put on or removed like a hat. The distance of the wire mesh from the eyes is such that it will give good visibility without fatigue.

— 272 —

Valve, High Pressure and Temperature, "H-P-M"

Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. [Vol.64,p.333.]

The "Forgsteel" valve, illustrated, is for use under high-pressure and high-temperature conditions. The valve is of the straight-way type. Its forged steel construction is said to permit a valve body of uniform section throughout so that there will be no unequal expansion or contraction. The steam opening is full and the path of the flow is confined to a minimum number of angles. The seat disk and the stem are made

of Monel metal, as is the valve seat.

The bonnet is made from machine steel and it is provided with a deep stuffing box that can be quickly repacked. The bronze packing gland is held in position by means of a Monel packing nut.

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Capscrew, "Hi-Tensile"

Victor Peninsula Co., Detroit, Mich. [Vol.64,p.337.]

The "Hi-Tensile" capscrews are made from steel having a carbon content of 0.30 to 0.37 and manganese

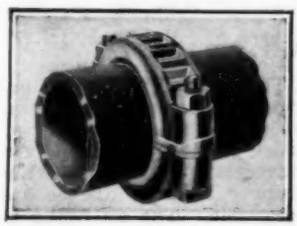
of from 0.65 to 0.85. The steel is comparable to S.A.E. No. 1035. The capscrews are forged cold, then heat-treated. The physical properties claimed for the screws when heat-treated are a yield point of from 70,000 to 100,000 lb. per sq.in., an ultimate strength of from 95,000 to 120,000 lb. per sq.in., a minimum elongation of 15 per cent, a minimum reduction of area of 45 per cent and from 196 to 231 Brinell hardness.

—274—

Pipe Joints, Flexible

Victaulic Co. of America, 26 Broadway, New York, N. Y. [Vol.64,p.379.]

The joint illustrated is adapted to steel, wrought iron or cast-iron pipe that has a small groove near the



ends that is about the depth of the ordinary screw thread.

The joint consists of a sectional housing which is clamped around the intersection of the pipe. Inside of the housing is a hollow inner ring, which seals the joint without pressure from the housing. An increase in pressure from the inside is said to add to the sealing qualities of the ring. An angle of 5 deg. on either side of the horizontal can be obtained by means of the joint.

It can be used on a vacuum or on a pressure up to 1,000 lb., where the temperature is not greater than 175 deg. F. Piping adapted for the joints is said to be now stocked in pipe mills.

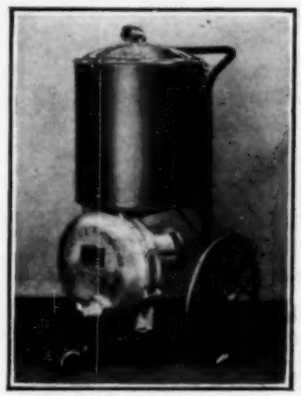
—275—

Vacuum Cleaner, Portable, No. 500

Allen & Billmyre Co., Inc., 512 Grand Central Palace, New York, N. Y. [Vol. 64, p.458.]

The portable, semi-heavy-duty vacuum cleaner illustrated has been designed by the above company and is listed as one of their "Tabco" products. An interesting feature of the machine is that it may be used also as a dust blower by attaching the hose to the discharge pipe.

The exhauster proper is



constructed entirely of aluminum. It is the two-stage centrifugal or turbo type. The exhauster unit and a dust collecting tank are carried in a tubular-steel frame mounted on wheels. The motor is rated at ½ hp. and is equipped with self-aligning ball bearings, lubricated by grease. The maximum vacuum attained is about 2.5 in. of mercury and the maximum volume is 75 cu.ft. per minute.

Standard equipment includes 15 ft. of 1½-in. flexible hose, wire reinforced, and 25 ft. of molded rubber-covered wire with the necessary connectors. The motor may be run on either d.c. or a.c. single-phase current, at 110 or 220 volts. The net weight is 105 lb. without tools or hose. The extreme height is 44 in., width 22½ in., and length 27 inches.

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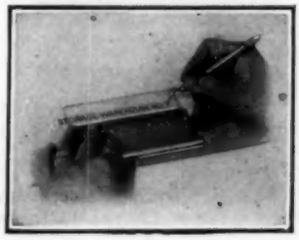
"Normograph"

Keuffel & Esser Co., 127 Fulton St., New York, N. Y. [Vol.64,p.459.]

The "Normograph" consists of a metal guide and a series of transparent xylonite lettering templets. Its purpose is to facilitate neat lettering of engineering and architectural drawings, signs and cards. The metal guide is held against the working edge of a T-square, or other straight edge and the jaw of the guide projects over the edge and holds the xylonite template.

The "Normograph" stencil has a system of perforations



that are so formed that when the point of a special pen is moved in contact with the edges either whole or part of the letters of the alphabet and of numerals are formed. The stencils have been designed so that there are as few openings as possible. Twelve different pairs of stencils, capitals and lower case, may be obtained in various styles and sizes of letters, either vertical or slanting.

The "Normograph" pen is shaped like a funnel and consequently has considerable ink capacity. The pen can be inserted in an ordinary pen-holder, or a special holder can be supplied.

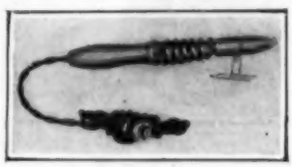
—277—

Soldering Iron, Electric

General Electric Co., Schenectady, N. Y. [Vol. 64, p.498.]

The electric soldering iron illustrated is of light construction and is designed to heat up quickly. It is made in standard sizes ranging from ¼- to 1¼-in. tip.

Power consumption ranges from 70 watts for the smallest iron for light and intermittent use, to 350 watts for the largest size on heavy duty. The latter are provided with radiating stands.



Rapid initial heating is claimed. Heat from the tip is prevented from reaching the handle by means of a special mechanical construction, consisting of a steel rod wound in the form of a spiral. This rod also provides a rigid connection between the handle and tip. The heating unit is imbedded in a highly compressed insulating powder that will withstand temperatures of more than 2,000 deg. F. The iron is provided with a standard lead and connection plug.

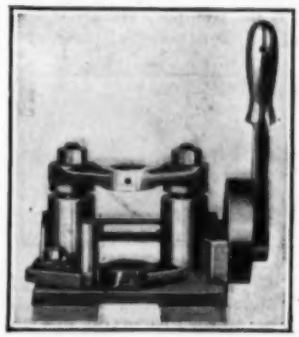
—278—

Jigs, Quick-Clamp, "Michigan"

Universal Sales Co., 500 Murphy Bldg., Detroit. Mich. [Vol.64,p.533.]

Quick-clamp jigs, manufactured by the Michigan Machine Co., are being made in two types and ten sizes for single- and multiple-spindle drilling in production work.

The type 2 jig illustrated is intended to replace the screw-bush type of jig. It consists of a base with two columns in which are two rack-toothed pillars supporting a bushing plate. The bushing plate is bored to receive a drill bushing in alignment with the hole bored in the base to receive the work-holder or adapter. The pillars are actuated up and down by means of a pinion shaft. The handle of the mechanism locks when work is actually located in place.



For work in which the box type of jig is usually used, the type 4 jig has been provided. It consists of a square or rectangular base and four corner-posts to support the bushing plate. This is bored to receive the drill bushings. The same rack-and-pinion movement as that used in the type 2 jigs has been adopted for raising one or more pillars.

The locking mechanism is designed so that downward pressure on the handle will lock the mechanism and a slight upward pressure will release it. The pressure of the drill on the work also tends to lock the mechanism.

—279—

Spring Winder, Coil

Fostoria Screw Co., Fostoria, Ohio. [Vol.64,p.579.]

This hand machine for winding coil springs is designed for clamping to any workbench or table.

The general construction of the machine can be seen from the accompanying illustra-

tion. The size of the spring is determined by the size of the mandrel used, while the pitch or lead of the spring is determined by the setting of the cam which is adjustable in its position to produce the desired pitch.

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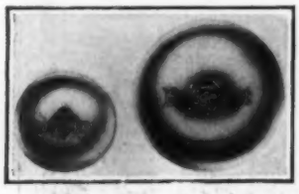
Traffic Spots

Bridgeport Brass Co., Bridgeport, Conn. [Vol.64, p.618.]

Brass cups originally designed for traffic purposes such as for pedestrian lanes and traffic divisional lines are



being applied to the marking of lanes in industrial plants.

The spots are made in two sizes, 3 and 4½ in. in diam. It is recommended that the 3-in. spots be spaced 12 in. center distance apart and that 16½ in. be the center distance apart of the 4½ in. spots.

— 281 —

Transmission Stand for Fords

Stevens & Co., 375 Broadway, N. Y. [Vol.64,p.618.]

This fixture facilitates the disassembly of the transmission, the flywheel magneto and the differential and ring gear of the Ford car or truck. The function of the device is to securely hold the various Ford units in a convenient position so as to prevent the slipping and turning that would otherwise occur when the units are pulled apart.

A simple frame that may be bolted to a bench or

mounted on a column stand, made of malleable iron, holds several attachments, two for holding the transmission assembly, the third for operations on the differential assembly.

The complete floor model with the stand weighs 97 lb. and the bench model weighs 31 pounds.

— 282 —

Wheel Puller and Hub Re-Threader

Stevens & Co., 375 Broadway, New York, N. Y. [Vol. 64,p.657.]

A combination wheel puller and hub re-threader has been added to the line of "Speed-Up" made by this company. The device is made in two sizes. The smaller one is adaptable to Ford and Chevrolet hubs and cuts 24 threads per in., the larger is adaptable to all other makes of automobiles and cuts 15 threads per inch.

The device is self-contained. Three dies are provided and are adjustable so that threads can be cut on hubs of any diameter. The re-threading is accomplished

by turning the die-holder by means of a monkey wrench applied to the square cut cast integral with the holder.

When used as a wheel puller, the dies act as clamps. The center bolt impinges against the shaft end and, when turned, it pushes the shaft out of the hub.

The large puller weighs 17 pounds.

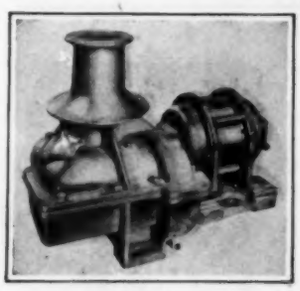
—283 —

"Car Spotter," Vertical-Capstan

H. W. Caldwell & Son Co., 1700 South Western Ave., Chicago, Ill. [Vol.64,p.690.]

The "car-spotter" illustrated is intended for moving and spotting cars. The capstan has a full working radius of 360 deg., so that relocating the machine is unnecessary.

The machine is automatically lubricated. It is driven by an electric motor through gears. Two sizes can be had.



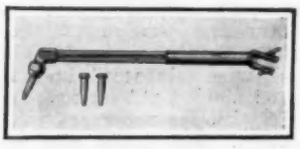
The No. 1 size has a speed up to 60 ft. per min. and will move up to three cars. The No. 2 machine will move six cars at a speed of 42 ft. per minute.

— 284 —

Torch, Welding, Type J-Jr

Alexander Milburn Co., Baltimore, Md. [Vol.64,p. 768.]

The small oxy-acetylene welding torch, type J-Jr, illustrated, is for work not requiring the usual standard



torch. Low pressures of oxygen and acetylene are used with the torch, and the gases may be supplied from generators or from tanks.

The torch is made of bronze forgings and drawn stainless steel tubing. The head is placed at an angle of 67½ deg. to the body.

The length of the torch is 18 in., and it weighs 25 oz. It is supplied with three welding tips.

— 285 —

Pipe, Spiral, Lock-Seam

Naylor Spiral Pipe Co., 1230 East 92nd St., Chicago, Ill. [Vol.64,p.880.]

To make the spiral lock-seam pipe illustrated a strip of sheet steel is wound into a

spiral shape, but instead of riveting, the edges are automatically flanged into a 4-ply lock-seam laid up on the outside of the pipe so as to permit the free and easy flow of material in conveying. The upper of the two sections shows the pipe with a high-carbon steel wearing strip for handling abrasive materials. The lower type is for water, air, gas and non-abrasives.

The pipe is formed in a continuous piece and then cut in the desired sections up to 40 ft. in length. It is made from 16- to 10-gage sheets and from 4 to 30 in. in diam. Plain, galvanized, painted and asphalted pipe can be had to meet varying conditions.

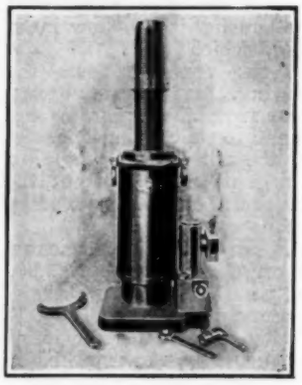
— 286 —

Jack, "Hydroscrew"

Watson-Stillman Co., 42 Church St., New York, N. Y. [Vol.64,p.924.]

The hydraulic jack illustrated is compact and light in weight, all working parts, of which there are five, and the valves, are outside the main plunger body and hence are accessible. The oil filling is held in a reservoir that is said to be leak-proof.

The ram is threaded and is provided with a safety nut to hold the load in any position



indefinitely. The ram cap is a separate piece and can be furnished in several lengths to give a height of jack ranging from 20½ to 42 inches. The jack is made with two capacities: 20 to 40 tons and 40 to 75 tons.

— 287 —

Shield, Eye, Non-shatterable, "Acme"

Chicago Eye Shield Co., 2300 Warren Ave., Chicago, Ill. [Vol.64,p.927.]

The "Acme" eye shield is designed especially for attaching to grinders, lathes

or to other machines in order to protect the eyes.

Nonshatterable glass 7x9 in. in size is used in the shield. The shield is mounted on a flexible arm so that it can be adjusted to any desired position. The flexible arm is 12 in. long. It has, also, a 6-in. bent iron arm, adjustable steel brackets,, a steel frame, pipe and lock nuts. A lamp attachment can also be provided for mounting on the arm near the shield.

The illustration shows the device attached to the bed of a lathe in order to prevent the chips from striking the operator's face.

— 288 —

Melting Pot, Electrical, Portable

Harold E. Trent, 259 North Lawrence St., Philadelphia, Pa. [Vol.64,p.928.]

The electrically-heated melting pot illustrated is a portable unit and is particularly designed for the maintenance of babbitt metal bearings.

The heat supplied to the pot can be controlled by a switch. Three stages are available for temperatures ranging up to 1,000 deg. F. The heating elements are of the Chromolox imbedded type and are insulated against

against heat losses to the outside by means of a refractory material between the crucible and the casing. The crucible and flange are cast in one piece from a selected iron that is resistant against the antimony in babbitt and type metals. The crucible is 6 in. in diam. and its capacity is 45 lb. of metal. Babbitt, type metal, solder, lead, and needle metal can be melted.

The pot operates on either a.c. or d.c., 110 or 220 volts. Special pots can be had for 440 and 600 volts. The power consumption is 1.2 kw. Type B-45 is supplied with 4 ft. of armored "Ovalflex" cable, while Type P-45 is supplied with 10 ft. of flexible wire and a plug connector. The overall dimensions are 10 in. in diam. and 8 in. in height.

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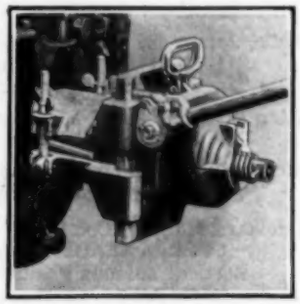
Puller, Pinion

Duff Manufacturing Co., Pittsburgh, Pa. [Vol.64,p. 1003.]

The pinion puller shown in the accompanying illustra-



tion is for railway, electrical and industrial mechanical and repair departments.

The puller consists essentially of two parts, clamping jaws and a screw jack. The jaws are of thin-lipped design and are intended to fit over the pinion. The screw-jack section slides into the jaw section. When the jaws are attached, the operator turns up the screw until it makes contact with the shaft of the motor. A few strokes will remove the pinion.

Three sizes of jaws are available for various sizes of pinions, pulleys or small flywheels. The device weighs 50 pounds.

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Boring Machines

—1—

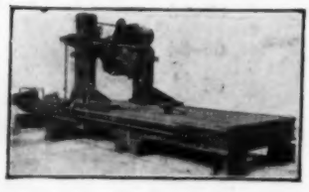
Boring Machine, Segmental Bed

Armstrong, Whitworth & Co., Ltd., Openshaw, Manchester, England. [Vol.63,p. 185E.]

This company recently completed a horizontal boring machine for segmental beds illustrated. The minimum radius bored is 1 ft. and the maximum radius is 1 ft. and 9 in. Segmental shaped beds up to approximately 4 ft. long can be bored. The machine will also face up to 3½ in. in diam. At the sides of the base plate are slides along which the two uprights are traversed, these uprights carrying a cross piece on which are arranged the main driving spindle and the driving gear. The driving motor is of 14 hp., running at from 850 to 1,250 r.p.m. The drive to the spindle is by double helical gearing and worm gear reduction.

The spindle-speed range is from 1¾ to 7 r.p.m. and the feeds are from 1/32 to ¼ in. per rev., or as set by change gears.

Not including the electrical



equipment, the approximate net weight of the machine for beds 10½ ft. long is 17 tons.

—2—

Boring Headstock, 10½-Inch

Haighs (Oldham) Ltd., Oldham, England. [Vol.63,p. 199E.]

For the boring of large castings, such as steam engine cylinders, which are bolted to a baseplate, this company is manufacturing as a complete unit a headstock of 10¾ in. height of centers, to the rear of which is bolted the feed bracket. The machine is available either right- or left-hand, with spindle nose and length of travel to suit the requirements. The spindle is 3½ in. in diam. and can have a travel of 4 ft. It is carried in a cast-iron sleeve which runs in phosphor-bronze bearings which are 5 in. in diam. and 6¼ in. long at the front, and 4½ in. in diam. and 6 in. long at the back. The sleeve is driven by a cone pulley 14½ in. to 7½ in. in diam. through a 4-in. belt, with back gearing which can be disengaged for the higher spindle speeds. With a 2-speed countershaft, the 12

speeds range from 6 to 300 revolutions per minute.

The overall floor space occupied by the machine is 10 ft. and 4 in. by 3 ft. and 4 inches.

—3—

Boring Machines, Horizontal, Duplex, for Electric Motor Housings

Machine Tool Works, Oerlikon, Switzerland. [Vol.64, p.145E.]

The duplex horizontal boring and milling machine is for dealing with the carcasses of electric motors. The entire height is about 20 in. above the table which carries the work. The table measures 33½ in. by 39¾ in. The two heads of the machine are adjustable along the bed.

The right-hand head is used solely for machining one side of the casting to take the end shield. To suit the work, it has longitudinal adjustment on the bed of 17¾ in., the left-hand head with a horizontal movement of 51¼ in., dealing similarly with the outer end of the

casting and also boring the interior.

The machine takes about 14-hp. and weighs about 18,700 pounds.

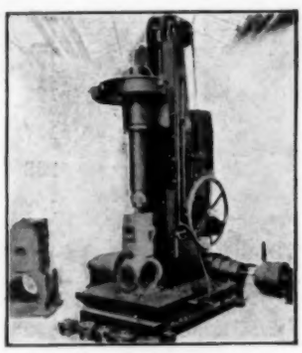
—4—

Boring Machine, Cylinder, Vertical

J. Holroyd & Co., Ltd., Milnrow, England. [Vol.63, p.216E.]

The vertical boring machine illustrated is designed for machining cylinders of oil engines. It will bore 8 in. in diam. by 22 in. long, the maximum diameter of work admitted being 16 inches.

The upright which carries the sliding boring head is a box casting bolted to the baseplate, which provides a working surface of 3 ft. by 2 ft. The boring head is a stiff casting balanced by weights and moving on the upright in long narrow guides. The snout is 5¼ in. in diam. fastened to the boring head by a spigot, and the spindle is of steel 3 in. in diam. The maximum traverse of the snout is 39 in. and the maximum distance of the spindle nose to the baseplate is 4 ft. The drive is by cone



pulleys through bevel and worm gearing, the ratio of the gearing being 19 to 1. The wormwheel on the spindle runs in oil. The four cutter speeds range from 10 to 25.6 r.p.m. The feed is by cone pulley, gearing and screw, and is reversible, the three rates ranging from 0.026 to 0.094 in. per rev. Adjustable, automatic knock-off motion is provided for both directions of feed and quick and fine hand motions are available for adjusting the position of the head.

The floor space occupied is about 6 ft. square, the total height of the machine is 10½ ft., and the weight is about 7,950 pounds.

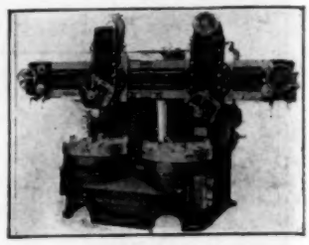
—5—

Turning and Boring Mill, Duplex, 30-Inch

Smith & Coventry, Ltd., Manchester, England. [Vol. 64,p.141E.]

A 30-in. duplex turning and boring mill has been built by this company. Pump lubrication is provided to all driving bearings of the machine, including the table spindle and the annular bearing under the table which is of "V" form and runs submerged in oil with a constant circulation. Starting, stopping, braking and speed-changing are carried out entirely from the operator's position.

Each unit of the machine is driven by a single con-



stant-speed pulley through a gear box giving 12 table speeds. The left-hand table can be reversed for left-hand cutting to bring the cutter pressure on the cross-slide. The machine illustrated has two 30-in. diam. chuck tables at 36-in. centers and admits 18 in. under the slide, and 28 in. under the turret when in its highest position. The turret slide has a total traverse of 22 in. The weight of the machine is about 9 tons.

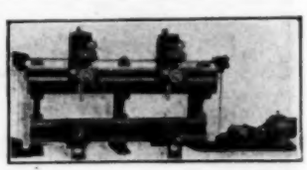
—6—

Boring Machine, Duplex, for Locomotive Work

G. Swift & Sons, Ltd., Halifax, England. [Vol.63, p.174E.]

A machine for drilling and boring connecting and coupling rods and other locomotive work will drill holes in steel up to 3 in. in diam. and bore and trepan holes up to 14 in. in diam., and admits work 4½ ft. deep between the spindle and the floor.

The tables are mounted on slides and are adjustable in



T-slots along the cross-rail by rack and pinion.

The spindles have a traverse of 18 in. with both fine hand and power feeds as well as quick advance and return, and reverse motion for tapping. The 18 spindle speeds range from 14 to 300 r.p.m. The drive is by two 12-hp. shunt motors. The drive from the gearbox is by vertical shaft.

The floor space occupied by the machine is 30 ft. 4 in. x 6 ft. 8 in. and the weight is about 12½ tons.

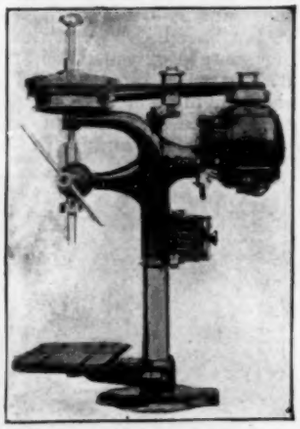
Drilling Machines

—7—

Drilling Machine, Motor-Driven

Buck & Hickman, Ltd., Whitechapel Rd., London, E., England. [Vol.64,p.95E.]

On a recent electrically driven drill built by this company the motor approximately balances the spindle, and the machine can be run without



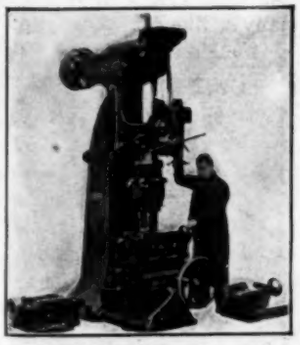
being bolted down. It drills to the center of 13½ in. diam. and ⅞-in. holes can be drilled in steel. It takes 12 in. between the spindle end and the worktable. The spindle is bored No. 1 Morse taper, and has a feed by hand of 3½ in.

—8—

Drilling Machine, Vertical, Six-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.63,p.216E.]

The special box-body vertical drilling machine here shown is fitted with a six-spindle head for drilling the holes in gas burners of



various types. The drive is through fast and loose pulleys and the main driving shaft has been geared to the spindle by means of bevel gears. The spindle runs at 190 r.p.m. The power feed is applied by means of friction gear, on the release of which the spindle can be quickly withdrawn by hand.

In the drilling head the 6 spindles are arranged in two groups of three. Three holes are, therefore, drilled in two burners simultaneously. The spindles are at fixed centers and are driven by the main spindle by means of spur gears. The multiple head is fed downward with the main spindle, but each spindle has independent adjustment. The maximum vertical feed of the spindles is 12 in. at 60 and 40 cuts per in. A base bolted to the body provides for table traverses of 8 in. transverse and 23 in. longitudinal.

The floor space occupied is 6x5 ft. and the approximate weight, without jigs, is about 2¼ tons.

—9—

Drilling Machine, Duplex, 18-Spindle

J. Holroyd & Co., Ltd., Milnrow, England. [Vol.63, p.226E.]

The 18-spindle duplex drilling machine is for drilling holes at the ends of pressed steel bars for railway cars. Mounted on floor beams are

two beds carrying the drill heads and also the knee slides for holding the work. The machine can be used for other long work, being arranged so that the heads move forward slowly, automatically reverse, return quickly and stop ready for loading the next piece of work.

When using the heads independently for small work they can be given a continuous cycle of feed and quick return. Each of the two drilling heads has nine spindles, and the machine will drill holes ⅛ in. in diam., the maximum length of feed being 12 in. Both slides have also a 12-in. hand adjustment on the beds. The maximum rectangle covered by the drill heads is 22x9 in., or a square of 15 in. side and circles of 15 in. diam., the minimum distance between the spindles being 2¼ in.

Without motors the machine weighs 6¾ tons.

—10—

Drilling Machine, Duplex, 3-Spindle

J. Holroyd & Co., Ltd., Milnrow, England. [Vol.64, p.2E.]

A 3-spindle duplex drilling machine has been specially designed for drilling channel irons, three 1 1/16-in. holes being drilled each side of the channel simultaneously. On the same bed the work jig is placed between two drilling heads, each of the latter having adjustable spindles.

The drill heads are of the multiple-spindle type with universal joints, and the drill spindles are bored No. 3 Morse taper and can be

set to minimum centers of 2¼ in., the maximum rectangle formed being 9x6 in. The maximum width of work taken is 12 in., the minimum width being 6 in.

The drive is by a 10-hp. motor running at 750 to 1,500 r.p.m. and driving through spur gears to a back longitudinal shaft and then through gearing to the headstocks. The right-hand headstock can be disconnected so that, if desired, only the left-hand head need be working.

—11—

Drilling Machines Sensitive, High Speed

H. Druce & Co., Ltd., Coventry, England. [Vol.64,p. 41E.]

The vertical drilling machines made by this company can have from one to four spindles, each driven by a 6-in. pulley and a belt 1¼-in. wide and each having six speeds of from 230 to 2,050 r.p.m. The machines are made with plain spindle and hand lever feed, plain spindle with automatic feed, and with geared spindle and

automatic feed. The automatic feed can be fitted to any machine at any time.

The plain spindle machine will drill up to 1-in. and the geared spindle machine up to 1¼-in. in diam., the tapping sizes in cast iron being respectively ⅝ and 1 in., while in each case the vertical travel of the spindle is 5-in.

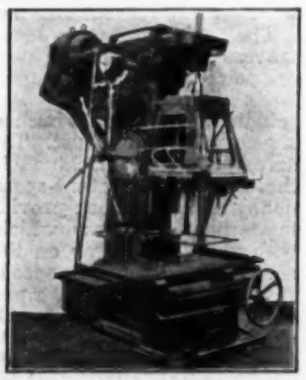
—12—

Drilling Machine, Multiple-Spindle, Heavy-Duty

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.64,p.148E.]

The illustration shows this company's eight-spindle heavy duty drill. The drive shown is by a 20-hp. motor mounted on a bracket at the top of the machine. If required, however, it can be effected by a countershaft carried at the base of the machine. Three speeds are provided by means of sliding gears.

The spindle head is counterbalanced and carries a central spindle bored for No. 5 Morse taper; also spindles up to a maximum number of eight with No. 2 or No. 3 Morse taper holes. They



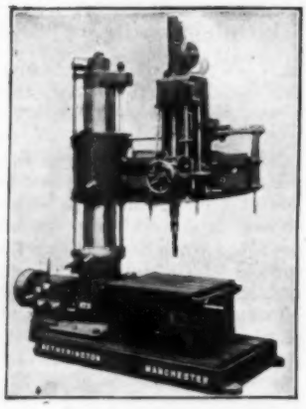
are driven through cluster gears and universal joints. The spindles are carried by the usual adjustable arms, ball thrust bearings being provided. The three automatic feeds are positively driven from the main shaft and sliding gears. Final transmission is through worm gearing, the worm being carried in a swinging bracket. The feed is automatically tripped at the required depth by an adjustable dog carried on a graduated disk. The table has two positions and can be rapidly brought into either by means of air pressure. The table can also be quickly traversed by a handwheel at the front operating through a rack and pinion. A coolant pump delivers the lubricant through a separate pipe for each drill.

— 13 —

Drilling Machine, Radial, 4-Foot

J. Hetherington & Sons, Ltd., Manchester, England. [Vol.63,p.195E.]

The radial drilling machine illustrated is intended for heavy duty, and swings a maximum radius of 4 ft. and a minimum radius of 1½ ft. The baseplate is T-slotted



and provides a working surface of 4 ft. and 3 in., by 3 ft. On it is a box table having a top surface of 3x2½ ft. An outer tube on the column carries the radial arm on ball and roller bearings.

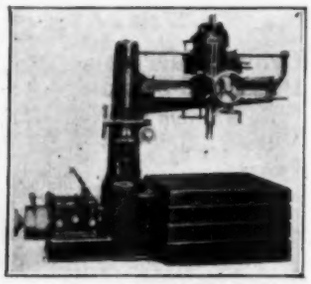
The spindle has a feed traverse of 18 in. by hand or power. Four automatic feeds are provided. The spindle is carried in a bushed sleeve with ball thrust. The drive of the machine is through a constant-speed pulley and a gearbox providing nine changes which, with the double gear on the saddle, gives 18 spindle speeds ranging from 42 to 550 r.pm. The maximum height admitted between the baseplate and the spindle nose is 5 ft. The vertical adjustment of the arm is 2 ft. and 5 inches.

— 14 —

Drilling Machines, Radial

Midgley & Sutcliffe, Bradford, England. [Vol.63,p.231E.]

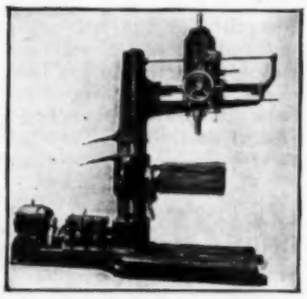
The heavy-type radial drill is made in five sizes ranging from 4-ft. to 6-ft. radius, and is an entirely all-geared model. By means of three mitre wheels and steel dog clutches, reverse motion for tapping is arranged. With the lever in the neutral position the spindle is stationary, although the driving gear of the machine can be running. The spindle is of steel 2½ in. in diameter. in the larger sizes. It runs in gunmetal



bearings carried in a 3¾-in. diam. socket.

A positive drive to the spindle is provided, the eight speeds ranging from 21 to 450 r.p.m. To insure steady motion, the drive to the top horizontal shaft is through spiral gears. Three feeds are provided from 0.0069 to 0.017 in. per revolution of the spindle. It can be provided with a high bed, or a with a low base on which a loose box can be carried. By an extension of the bed a motor drive can also be provided.

The company also supplies machines for lighter work and occasional heavy, the same spindle head and bearbox being employed and the same arm. The pillar is turned on the lower part



where it carries a swinging box table which has a vertical movement by rack. In addition, it can have a swivelling motion through worm and wormwheel. These machines are made with radii of 3½ ft. and 4 feet.

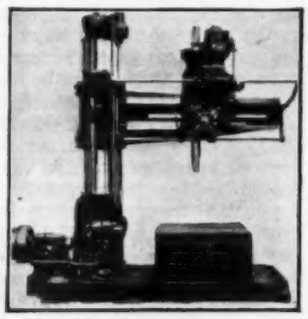
— 15 —

Drilling Machine, Radial, 6-Foot

F. Town & Sons, Halifax, England. [Vol.64,p.70E.]

The 6-ft. radial drilling machine shown in the accompanying illustration has recently been added to the line of this firm. The machine can drill 4-in. holes from the solid in cast iron, and 3-in. holes in mild steel, and will trepan and bore up to 20 in. in diam. The minimum radius of the spindle is 1 ft. and 10 in., and work up to 6 ft. can be admitted between the spindle nose and the baseplate.

An improved friction reverse, of expanding-ring type, has been incorporated, and the saddle and sleeve are locked simultaneously by means of one lever. The foundation baseplate, which is 9 in. deep, has a working surface of 6x3 ft. 7 in. The arm is raised on the sleeve a distance of 2 ft. and 11 in. by power. The balanced steel spindle is 2⅞ in. in diam. in the smallest part, and has a vertical traverse of 18 in.



Twenty-seven speeds are available, ranging from 450 to 12 r.p.m. The removable worktable is 42x36 in. in area and 22 in. deep.

Overall the machine is 11 ft. long by 3 ft. and 8 in. wide, and stands 12 ft. and 7 in. high. It weighs 6½ tons.

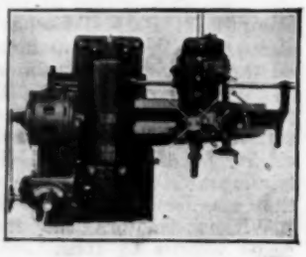
— 16 —

Drilling Machine, Radial, Wall-Type, Motor-Driven, 3½-Foot

G. Swift & Son, Ltd., Halifax, England [Vol.64,p.90E.]

The 3½-foot wall drilling machine illustrated is equipped with a 5-hp. motor and a 4-speed gearbox drive. The arm is of tubular section and swings through 190 deg. The saddle has a 2½-ft. traverse along the arm.

The machine illustrated is suitable for drilling holes up to 1¼ in. in diam., but if required it can be fitted with double gears on the saddle for drilling holes up to 2 in. in diam. The four spindle speeds range from 140 to 500 r.p.m., while if double gears are fitted the eight spindle speeds vary from 40 to 500 r.p.m. The vertical traverse is 12 in. The feed box, placed at the top of the saddle, gives three geared



feeds, 55, 75 and 105 revolutions per minute.

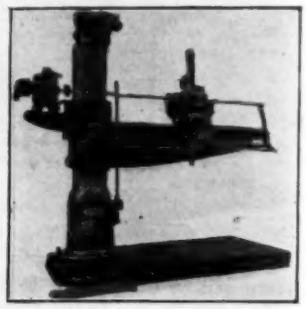
The approximate gross weight of the machine is 2,910 pounds.

— 17 —

Drilling Machine, Radial, Motor-Driven, 10-Foot

W. Asquith, Ltd., Halifax, England. [Vol.64,p.142E.]

The 10-ft. medium-type motor-driven radial drilling, boring, tapping and studding machine allows work 7½ ft. deep to be admitted between the spindle nose and the top of the baseplate. The working surface of the latter is 9 ft. and 8 in. by 4½ ft. The radial arm, of double tubular section, can be raised and lowered 3 ft. and 9 in. by



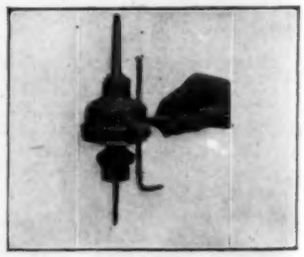
means of an auxiliary motor and worm-reduction gearing mounted at the top of the pillar. The slide carries a nine-speed gear box, with a speed plate and speed-change levers on the front of the saddle. Quick hand adjustment vertically is provided to the spindle.

— 18 —

Attachment, Tapping, Reversing, ¼-Inch

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 77E.]

A ¼-in. reversing tapper has been added to this company's line of these appliances, the other sizes being



½ and 1 in., respectively. The reverse operates automatically at increased speed, all of the gears employed being of hardened steel. An adjustable depth gage is fitted and the chuck allows the taps to float.

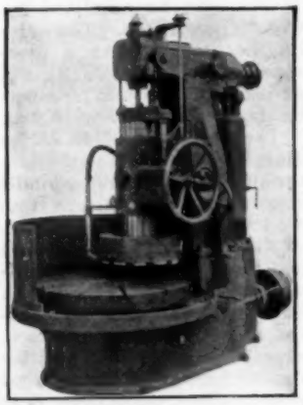
Grinding Machines

—19—

Grinding Machine, Surface, Vertical, "Lumsden"

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 31E.]

The grinding machine illustrated is built by the Lumsden Machine Co., Ltd., and has a rotating table 48 in. in diam. The wheel is 24 in. in diam. and carries 12 abrasive segments The wheel covers the radius of the table, so that the whole surface of the latter is traversed in one revolution. The grinding wheel is carried on a flanged



steel spindle mounted on roller bearings in a cylindrical ram. This ram is so carried in a cylindrical housing which is bolted direct to the column of the machine. A special ball thrust arrangement supports the spindle in such a way as automatically to take up any wear in the thrust bearings, and to prevent any drop of the spindle.

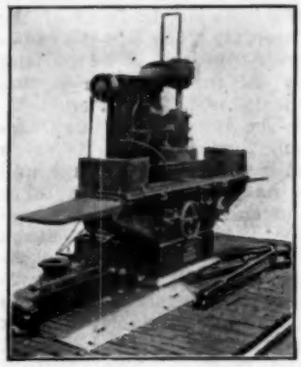
The ram motion has an adjustment of 12 in. but the vertical capacity from wheel to table can be made to suit requirements. The three table speeds are 4, 5.3 and 6.8 r.p.m. The automatic feed to the ram ranges from 0.0025 to 0.025 in. per revolution of the table.

—20—

Grinding Machine, Surface, Vertical-Spindle

Beyer, Peacock & Co., Ltd., Gorton, Manchester, England. [Vol.64,p.51E.]

The vertical-spindle surface grinding machine, illustrated, is suitable for work 5½ ft. long by 13 in. wide and 14 in. deep. The spindle carries a wheel 14 in. in diam.,



either of cup or segmental type. It has one table traverse speed; namely, 13 ft. per minute.

On the front of the body is mounted a slide bed carrying the table which moves on "V" and flat guiding surfaces. The table is 7 ft. 9 in. long overall by 22½ in. wide over the troughs and 15¾ in. wide over the slides. Automatic fine down feed motion is provided to the saddle, together with quick hand adjustment.

A 20 hp. motor is supplied but a lager motor can be used.

—21—

Grinding Machine, Centerless, No. 10

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England [Vol.64,p.148E.]

The No. 10 centerless grinding machine, illustrated, has a capacity for parallel work from ¼ in. to 4 in. in diam., and will deal with taper and shoulder work. The grinding, supporting and feeding members consist of a grinding wheel and a governing wheel with their peripheral faces opposed, and a work-supporting plate located between them. The work-supporting plate is carried in a holder which swivels vertically.

A diamond dresser is carried in a graduated swivel

slide. Vertical guide plates, located on each side of the grinding and governing wheels, can be adjusted to effect accurate lateral location of the work. For shoulder or for taper work which cannot be fed between the wheels, the supporting plate is set parallel so that no feeding action takes place. The machine is driven from the lineshaft through a single pulley. On the main shaft is also carried a two-step cone, inclosed in the body of the machine and driving by belt to the wheelhead. This has a cross-feed at right angles to the axis of the work; it is operated by a large pilot wheel in front, and a micrometer feed is also fitted. An automatic ejector which also acts as a length stop is provided for shoulder work.

—22—

Grinding Machine, Hob, Automatic, "Pfauter"

Dowding & Dickinson, Windsor House, Victoria St., London, S. W. [Vol.64,p. 152E.]

This company is marketing the "Pfauter" automatic hob grinding machine.

A description of the machine is given on page 87 in this issue of *American Machinist.*

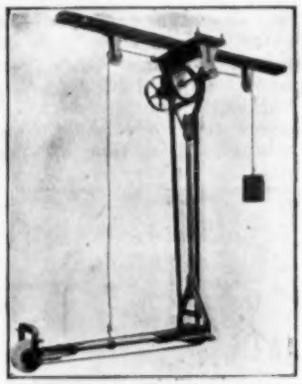
—23—

Grinder, Swing-Frame

Beyer, Peacock & Co., Ltd., Gorton, Manchester, England. [Vol.64,p.106E.]

The swing-frame grinder illustrated can be arranged for belt drive or direct motor drive, and all the shafts are carried on ball bearings, which are inclosed by dust caps. The grinders are for dealing with castings and rough work generally, and also for buffing. Wheels and buffs 12 in. in diam. are carried and driven usually at about 2,100 revolutions per minute.

The machine is suspended from above and includes a countershaft and hanger bracket, the bearings carrying the remainder of the machine. The straight portions of the frame are of round steel pipe. The design provides a universal jointed arrangement, giving a wide range of movement backwards and forwards, vertically and laterally, and the frame can also be swivelled to almost any angle. The horizontal arm which carries the grinding wheel or buff is



balanced by weights and slide collars. The wheel can be changed without interfering with the ball bearings.

—24—

Linisher Machine, No. B3

Turner Tool Manufacturing Co., Shadwell St., Birmingham, England. [Vol.64,p. 69E.]

The No. 3 linisher machine is now being marketed in a larger size, the B3, having a band table 18x11½ in. for a band 60 in. long by 8 in. wide, running on pulleys 6 in. in diam. by 9 in. wide at 2,000 r.p.m.; i.e. over 3,000 ft. per min. at the band.

A ball journal is provided at each end of the driving

spindle and two ball bearings in the loose pulley. The type of band employed is of double-coated extra-heavy Metallite cloth, suitable for grinding metals, and is available in grits from 80 to 24.

All its working parts are renewable, the weight of the machine being about 670 pounds.

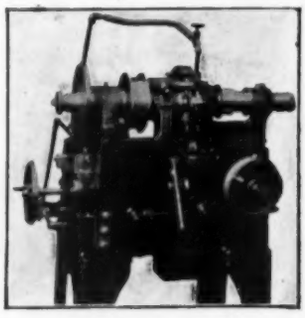
—25—

Grinding Machine Cam

Oldfield & Schofield Co., Ltd., Halifax, England. [Vol.64,p.104E.]

The grinding machine here illustrated is for dealing

with the cams employed for controlling the valve gear of motor-cycle and other engines. It is driven by an overhead countershaft of duplex type, one shaft controlling the motion of the



grinding wheel, while the other is for driving the workhead. A pair of four-speed cone pulleys is mounted on the countershaft. The workhead spindle is carried in a bracket, swinging on trunnions on a horizontal slide. The master cam is mounted at the back, and is kept in contact with a roller journal mounted in an adjustable bracket to suit various sizes of cams.

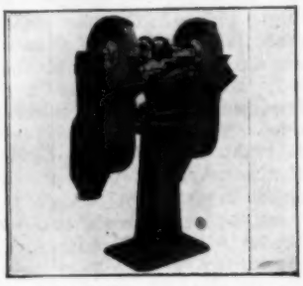
In front of the machine a handle and a swinging work bracket is fitted with an eccentric for the purpose of removing the work from the grinding wheel periodically for examination. Adjustable stops are provided.

— 26 —

Grinders, 8- and 12-Inch

Buck & Hickman, Ltd., Whitechapel Road, London, E., England. [Vol.63,p.258E.]

The 8- and 12-in. grinders are available in either pillar or bench type. The 12-in. machine carries two 12x2x1-in. wheels guarded as shown,



the height from the bench to the center of the spindle being 12 in. and the pillar type from the floor to the center of the spindle 38 in. The spindle is 26 in. long by 1 in. in diam. between the plates, its speed being 1,600 r.p.m.

A dust extractor is fitted to each wheel. The spindle runs on ball bearings at 2,500 r.p.m., with a Stauffer lubricator at each end. The dust can be discharged into a duct, tank of water or into a bag tied to each extractor, or can be forced up 20 ft. or more to a container.

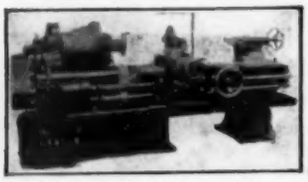
Lathes

— 27 —

Lathe, Center, 8½-Inch

H. Holmes & Co., Halifax, England. [Vol.63,p.194E.]

The 8½-in. center lathe of this firm has a bed 8 ft. long and 16 in. wide across the top. The lathe admits work



3 ft. and 8 in. long between the centers, swings 17⅛ in. in diam. over the bed, and 12⅛ in. over the saddle. The width of the gap is 13 in. and work 30 in. in diam. by 10 in. wide can be machined in the gap. The three-speed cone has diameters of 14, 12 and 10 in., for a 3¼-in. belt. Twelve spindle speeds are provided, ranging from 400 to 9.2 r.p.m. in geometric progression.

An automatic trip for sliding feeds, combined with dead stops for shoulder lengths, is provided by means of an adjustable bar. The loose headstock sets over for taper turning, the spindle being carried right through the handwheel. The countershaft is of the two-speed type, the bearings being ring-oiled, with the loose pulley running in a large sleeve that has Stauffer lubricators.

— 28 —

Lathe, Center, 16½-Inch

D. Mitchell & Co., Ltd., Keighley, England. [Vol.64, p.16E.]

The 16½-in. lathe will deal with work 9 ft. and 3 in. long between the centers and

swings 2 ft. and 4⅛ in. in diam. over the saddle, while the extra large gap admits work 5 ft. and 1 in. diam. by 18⅛ in. wide, in front of the faceplate. The box-end cantilever-type bed is 16 ft. long by 22 in. wide across the shears and 15 in. deep.

The spindle is of high carbon forged steel. It has a 4⅛-in. hole right through and a ball thrust washer takes the end thrust. The three-speed cone diameters range from 17⅝ to 22 in. for a 4¾-in. wide belt and with two-speed countershaft 18 spindle speeds are available, the back gear ratios being 4.25 to 1 and 18 to 1. The tailstock has cross adjustment for taper turning.

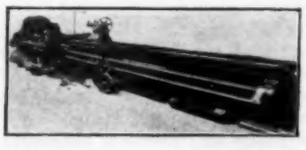
The apron is of the double-walled type. The cross-feed screw is fully inclosed by a sliding cover. Both the traverse and longitudinal feeds are operated by means of one friction knob. All nuts and screw needing adjustment in the everyday operation of the lathe are made so that only one wrench is required.

— 29 —

Lathe, Center, 16-Inch, Special

Armstrong, Whitworth & Co., Ltd., Openshaw, Manchester, England. [Vol.64, p.64E.]

The special 16-in. center lathe has a bed 44 ft. and 3 in. long, swings 25 in. diam. over the saddle and



takes work 35 ft. long between the centers. The fast headstock is driven by a four-step cone pulley, the steps ranging from 16 to 26 in. in diam. and 5¾ in. wide each. Both single and double reduction back gears are provided, one pair of wheels on the back gear eccentric shaft being of the sliding type.

The loose tailstock carries a trigger which engages with the rack in the bed. The saddle has a traverse slide for use either for parallel or taper turning, and carries a compound swivel top rest. A gearbox on the bed in front of the headstock provides three feeds; namely, 8, 16 and 32 cuts per in., the box being of the sliding gear type.

— 30 —

Lathe, Center, Crankshaft and Piston, 27-Inch

C. Redman & Sons, Ltd., Halifax, England. [Vol.64, p.78E.]

The 27-in. center lathe of this firm is specially adapted for turning crankshafts, pistons and piston rods. The straight bed is 31 ft. long by 32 in. wide across the

shears by 16 in. deep, braced by cross bars at frequent intervals, and has large square guide ways. Work up to 22⅛ ft. can be admitted between the centers. The driving headstock bears a four-speed cone pulley 17⅛, 21, 24⅛ and 28 in. in diam., respectively, for a 4⅛-in. wide belt.

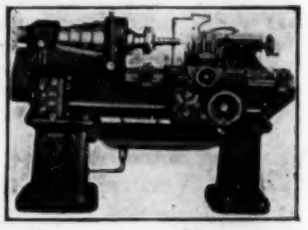
The faceplate is 48 in. in diam., with a two-speed counter-shaft, sixteen spindle speeds are available, from 8.4 to 608 r.p.m. Work 54 in. in diam. can be machined on the faceplate without re-setting the cutting tool. A quick-change gearbox, located under the headstock, gives six rates of positive feeds through a front feed shaft; these vary from 8 to 32 cuts per in. of traverse, and a friction safety slipping device prevents breakage. The loose tailstock has a shoot 4⅛ in. in diameter.

— 31 —

Lathe, Manufacturing, Precision

United Machine Tool Co., Ltd., Gray's Inn Rd., London, W. C., England. [Vol.64,p. 127E.]

The center lathe illustrated employs accurate measuring or master blocks, which are used in conjunction with a



special form of feed trip incorporating a differential gear. The principle employed on this machine is that a fixed abutment on the traveling slide makes contact with a stop which, although adjustable, is fixed in operation.

This arrests the motion of the slide, while the feed shaft continues to rotate. When a certain pressure is reached, a differential gear is brought into operation and disengages the feed.

Four quick changes of feed are provided, and change wheels enable this range to be doubled or quadrupled as desired. Standard feeds range from 0.002 to 0.02 in. per revolution of the spindle. The height of centers is 7 in. and four standard lengths of bed are available, giving capacities between the centers of 15½ to 39½ in. The spindle is bored 1⅝ in. A four-step cone with gearing provides eight speeds ranging from 50 to 600 revolutions per minute.

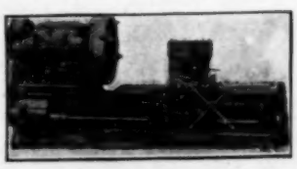
—32—

Lathe, Surfacing and Boring, 36-Inch

Dean, Smith & Grace, Ltd., Keighley, England. [Vol.63, p.221E.]

The 36-in. surfacing and boring lathe illustrated swings 60 in. in diameter by 13¾ in. wide in the gap and admits work 4 ft. long between the chuck and turret face. The machine can be equipped with hexagon turret and hexagon stop bar, as illustrated or with a compound slide-rest and stop rod as well as a leading screw for screw-cutting. The headstock gives 16 spindle speeds, ranging from 240 to 2.5 r.p.m., and is driven by a flanged pulley 13¾ in. in diam. for a 6-in. belt.

The high-speed shafts revolve on ball bearings. The sliding wheels are carried on a six-spline shaft of treated steel. The eight slowest speeds are obtained through a steel gear bolted to the back



of the 36-in. four-jawed chuck, and are driven by a pinion solid with the shaft. A pump inside the headstock supplies lubricant to the gears.

The bed is 10 ft. and 3 in. long by 22¾ in. across the shears, and 29 in. deep under the head. It has a narrow guide at the front for the saddle. The hexagon turret is mounted in a slide which has cross movement for surfacing. The hexagonal stop bar is operated by chain drive. The four-speed box, under the driving head, gives feeds of 36 to 9 cuts per in. The feed reverse is placed inside the gear box and can be operated with the gears running.

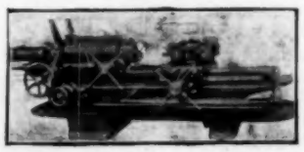
The lathe occupies a floor space of 12 ft. by 5 ft. and 4 in., takes 15 hp. to drive, and weighs about 11,300 pounds.

—33—

Lathe, Hexagon-Turret with Covered Bed

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 30E.]

The No. 13A hexagon-turret lathe will take 2¾-in. bars, the maximum length turned being 36 in. Driven by a 12-in. diam. single pulley, the



all-gear head gives 16 spindle speeds in either direction, ranging from 20 to 500 r.p.m. In this head sliding gears and friction clutches are used, starting, stopping and reversal being controlled by lever. All the shafts in the head are supported on ball bearings, the main spindle running on roller bearings of the short roller type. End thrust is taken by double ball-thrust bearings.

In common with other turret lathes made by the same firm this machine has covered beds, the guides being completely protected from any injury.

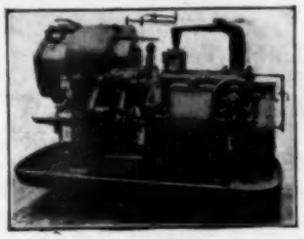
—34—

Lathe, No. 2A, "Auto"

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 50E.]

The No. 2A "Auto" lathe in general design and appearance resembles the No. 2 machine but is improved. A feature is the use of a totally-inclosed headstock. The driving shaft of the headstock and its loose pulleys run on ball bearings, while the cam drum is enclosed and runs in oil. Independent cross-bars are fitted at the back and front.

The machine has a maximum swing of 8¼-in. in diam., the working stroke of the capstan being 6¼ in. The stroke of the cross slides is 3¼ in. The capstan has four faces, the tools interchanging with the firm's No. 2 "Auto" lathe and Nos. 4 and 4B capstan lathes. The tool holes are 1¼ in. in diam., centered 3¼ in. above the slide.

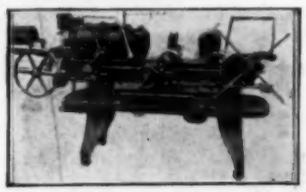


—35—

Lathe, Stud and Bolt

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 62E.]

This firm's stud and bolt lathe is essentially the No. 4 capstan lathe, modified in certain details for the production of work from the bar, or, with a suitable chuck, it can be employed on forgings



Its height of centers is 6½ in. The largest bar admitted is 2 in., and the working stroke of the capstan is 9 in. A single-pulley all-geared head is provided, giving eight spindle speeds ranging from 30 to 511 r.p.m.

—36—

Lathe, Capstan, No. 4B

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 94E.]

The No. 4B capstan lathe is intended to deal with repetition work in quantity. The all-geared head gives four speeds. The machine is similar both to the firm's No. 4 capstan lathe and also to the stud and bolt lathe. Instead of a chasing saddle, the lathe has a traversing saddle sim-

ilar to that on the stud and bolt lathe, and screw threads, when required, are cut by Coventry dieheads or collapsing taps.

The height of centers is 6½ in., the swing over the cross-slide is 6¼ in. in diam., and the hole in the spindle is 2⅛ in. in diam. The maximum distance from the end of the spindle to the face of the capstan is 3¼ in. and the working stroke of the capstan is 9 inches.

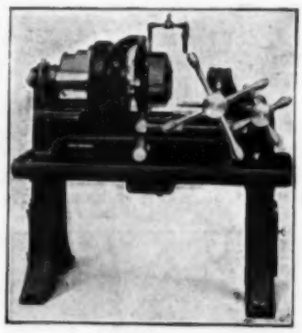
—37—

Screw Machine, Tangential-Die

Joshua Heap & Co., Ltd., Ashton-under-Lyne, England. [Vol.64,p.78E.]

The illustration shows this company's machine for screwing 1-in. Whitworth bolts, tapping nuts and also for screwing pipes up to ¾ in., when desired. Single-head machines of a somewhat similar design are available to screw bolts up to 4 in. in diam., while double-headed machines are available for bolts up to 2½ in. in diam.

The drive is by a cone pulley mounted on a back shaft giving three spindle speeds. The saddle has a travel of



7½ in. The vise is of a box-pattern, open-jaw, self-centering type, traveling right up to the diehead so that short and irregular-shaped bolts can be dealt with.

The net weight of the machine illustrated is 1,540 pounds.

—38—

Lathe, Turning and Boring, Carding-Engine Cylinder

Cunliffe & Croom, Ltd., Manchester, England. [Vol. 63,p.186E.]

The special cylinder lathe is for simultaneously turning and boring or ending up flax carding engine cylinders 5 ft. in diam. and 6 ft. long. The main bed is well ribbed, 13 ft. and 3 in. long by 9 in. deep. The drive is by a 7½-hp. motor running at 300 to 900 r.p.m., mounted on an extension of the base plate and driving by spur reduction gearing and bevel gearing to the worm gear on the

headstock. The speeds are 0.66 to 2 revolutions per minute.

The fixed headstock carries a driver plate bearing four adjustable drivers. Carried on the bed is a slide 10 ft. and 9 in. long, 14 in. deep and 2 ft. wide, which has an adjustment to and from the center by parallel screw motion. It is supported at the

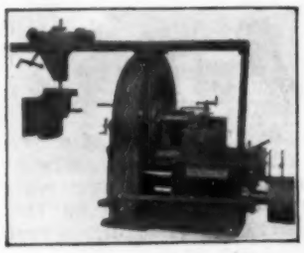
center of its length and at its two ends. Three tool carriages are provided, those at the outside being used for boring and ending up and having automatic and reversible feeds ranging from 0.034 to 0.095 in. per revolution.

—39—

Boring and Facing Machine, Axle-Box

J. Lang & Sons, Ltd., Johnstone, England. [Vol.64,p. 26E.]

This machine is designed primarily for boring and facing locomotive axle boxes but is suitable for work which is not necessarily



turned on the outside diameter but is bored and machined on both faces. An example is a motor yoke. Both faces and the bore are machined simultaneously.

The machine will take boxes up to 26 in. across the corners, the minimum size depending principally on the diameter of the hole to be produced. A central housing has an internal bearing in which the hollow spindle or chuck can rotate, the latter being driven by a spur pinion with 20 teeth, 3½ d.p., which gears into a ring of 160 teeth. The axle boxes are held by means of adjustable jaws. The machine is driven by single pulley and gear box.

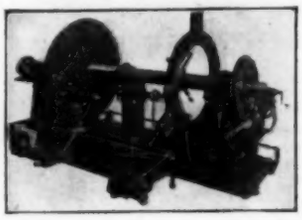
It occupies a floor space of about 8 ft. 3 in. by 6 ft. 3 in. and weighs about 12,500 pounds.

—40—

Lathe, Turning and Boring, for Cylinder Liners

Scott Bros. (Halifax) Ltd., Halifax, England. [Vol.64, p.51E.]

The turning and boring lathe is designed as an ordinary surfacing and boring lathe, but by means of special attachments is adapted for turning and boring marine engine cylinder liners up to 3 ft. and 5 in. in diam. by 5 ft. and 9 in. long. The foundation baseplate is 11 ft. long by 3½ ft. wide by 6 in. deep. The bed has two projecting pieces bolted to the front which in turn support an auxiliary bed 7 ft. and 3 in. long by 14 in. wide and 12 in. deep. This bed carries a traveling pillar and a compound slide-rest for turning outside diameters. A separate pillar rest is also fitted to the foundation baseplate for end turning and boring.



The all-geared driving headstock has ring-oiled bearings, the drive being from a flanged pulley 16 in. in diam. by 14½ in. wide, running at 400 r.p.m. It provides 16 spindle speeds ranging from 3.26 to 133 r.p.m.

—41—

Lathe, Turning and Grinding, Car-Wheel Duplex

Hulse & Co., Ltd., Salford, England. [Vol.64,p.108E.]

The duplex lathe is for the combined turning and grinding of the treads of car wheels. It will deal simultaneously with a pair of wheels from 2 ft. and 11½ in., to 3 ft. and 7½ in. in diam. on the tread, the wheels being held and driven by their axles. The maximum length admitted between the faceplates is 8 ft., and the minimum distance 6 ft. and 3 in., the height of centers being 24 in. The drive for the fast headstock is by a 35-hp. motor having a speed variation of 3 to 1.

The movable headstock is secured to the baseplate by holding down bolts, the front pair having a quick gripping device, and it is adjustable along the bed by quick power traverse driven direct by a 5-hp. constant-speed reversible motor. The faceplates are each 4 ft. in diam. A gaging device is available for quickly determining the lowest point of wear on the wheels to be

turned. A variable self-acting feed motion in six steps from $\frac{1}{16}$ to $\frac{3}{8}$ in. per revolution is obtained by means of a ratchet apparatus self-contained with the lathe.

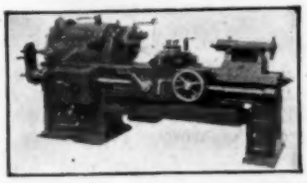
The two grinding heads are arranged at the back of the machine so as to clear the headstocks. Each head is driven by a 15-hp. constant speed motor running at 1,420 r.p.m., driving the grinding head in the case of the machine illustrated at 850 r.p.m. The five feed rates range from 1/1,200 in. to 1/240 in. for the double stroke. The grinding headstocks each carry a disk 21½ in. in diam., with 12 abrasive segments adjustable for wear.

—42—

Lathe, Relieving, Universal, Improved

Smith & Coventry, Ltd., Salford, Manchester, England. [Vol.64,p.156E.]

In the improved universal relieving lathe, illustrated, the machine has been redesigned so that the length of all the shafts has been shortened. The headstock is of the all-geared type with single-pulley drive. The pulley



gives eight forward speeds and two reverse speeds. The bed is of the narrow-guide type, the narrow guide being a downward projecting lip of V-section along the front of the bed.

The cam device consists of a bar transversely adjustable on the rear end of the reciprocating slide and having a contact member which can be adjusted to engage a cam-operated lever at any suitable distance from the lever fulcrum. The machine has 9½-in. centers and with an 8-ft. bed admits 33 in. between the centers. It has a 2½-in. hole through the spindle and swings 10¾ in. diam. over the slides. It can be fitted when required with apparatus for relieving profile cutters without the necessity of making corresponding form tools.

—43—

Attachment for Lathes, Universal, Milling

L. H. Wadsworth & Co., 57 Denbigh St., Pimlico, S. W., England. [Vol.63,p.239E.]

A small universal milling attachment has been designed that is suitable for attaching to lathes of from 3 to 6 in. height of centers and can be used for such opera-

tions as end milling, keyway cutting, drilling, dividing, gear cutting, grinding, etc. The spindle is carried in a housing which is arranged to swivel in the horizontal and vertical planes.

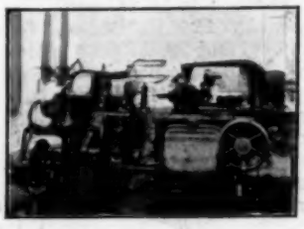
The illustration shows the attachment for drive by belt, but the idler pulleys can be replaced by a gear wheel stud for reduction gear drive or a dividing attachment can be fitted to the spindle in place of the pulleys. The spindle is hollow bored for a No. 1 Morse taper to take drill chucks, tools, etc., and a ball thrust is also provided.

—44—

Tool Support, Overhead, for "Auto" Lathe

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 31E.]

In connection with the No. 2 "Auto" lathe, this company now supplies an overhead support which has been specially designed for fitting to existing machines, the support being standard on the latest machines. By its means the turret tools are given rigid guidance, enabling coarser feeds to be used and



higher cutting speeds, without the production of chatter.

For application to existing machines a bracket fits over the curved cover of the headstock, as illustrated, the bolts in the headstock being lengthened to suit. From the bracket projects a turned stem, which extends immediately in front of and above the lathe chuck and bushings carried by the toolholder slide along this projecting bar.

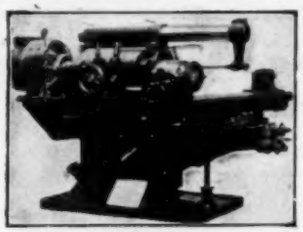
Milling Machines

—45—

Milling Machine, Universal, All-Gear Head

Carter & Wright, Halifax, England. [Vol.63,p.184E.]

The motor driven all-gear head universal milling machine illustrated has 16 spindle speeds ranging from 16 to 280 r.p.m. The table has a working surface of 4 ft. and 6 in. by 17 in. It swivels 55 deg. in either direction on a slide mounted on the knee



bracket. The 8-hp. constant speed motor drives by pinion direct to the all-geared headstock.

The spindle nose is 4⅜ in. in diam. The end thrust is taken on a ball washer. The overhanging arm is 5 in. in diam. The 16 feeds range from ½ to 20 in. per min. The longitudinal power feed in either direction is 28 in., while the cross power feed is 10 in., and the vertical power feed 18 inches.

—46—

Milling Machines, Horizontal, Motor-Driven

Henry Milnes, Bradford, England. [Vol.64,p.40E.]

The electrically-driven milling machine provides 10 spindle speeds ranging from 32 to 843 r.p.m. The table, 15x7 in., will traverse 12 in. longitudinally, with a traverse movement of 6½ in., and 13 in. adjustment vertically.

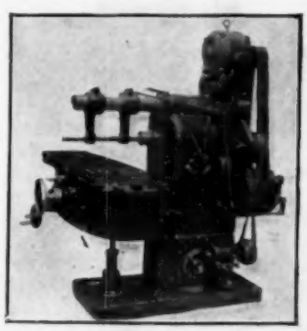
The driving wheel has 5 speeds, which are doubled by double gearing in the headstock. The tailstock has an elevating motion for taper work and a supplementary swiveling table is provided for angular work. A vertical milling machine attachment not shown is also provided and is driven by double gears, the spindle being arranged so that it can mill at any angle.

—47—

Milling Machine, All-Geared, Motor-Driven

Ward, Haggas & Smith, Keighley, England. [Vol.64, p.130E.]

This company has developed a line of all-geared milling machines for general engineering work, and the illustration shows the No. 2 machine having a table with a working surface of 4½ ft. by 13 in. The 5-hp. constant-speed electric motor which runs at 700 r.p.m. is mounted



at the top of the machine body and drives by belt to the main pulley which runs at 350 revolutions per minute.

The nine spindle speeds vary from 21.4 to 295 r.p.m., the changes being effected through two levers and sliding gears on castellated shafts, the gears being of steel, heat-treated and running in oil. Two arbor supports are fitted on the overarm. All bearings are bushed with phosphor-bronze. The machine can be supplied with a knee brace if desired.

—48—

Milling Machine, Spline and Slot, Automatic

Dowding's Machine Tool Co., Ltd., Bush House, Aldwych, London, W. C., England. [Vol.63,p.267E.]

The automatic spline and slot miller made by this firm has a sectional table. The top platen which carries the work can be quickly adjusted longitudinally on the lower part by screw, so that slots

longer than the stroke can be cut at one or more operations without shifting or reclamping the work. Similarly a number of separate slots or splines may be milled in a line. The machine will cut slots 1 in. in diam. in one operation up to 6 in. in length, this including 1 in. for the cutter diameter.

The table has a working surface of 20 in. by 7 in., the adjustment of the top section being 15¾ in. The automatic travel is 5⅛ inches.

About 1 hp. is required for driving the machine. The floor space occupied is 44 x 44 in. and the net weight is 1,050 pounds.

—49—

Keyway-Cutting Machine, Hand-Driven

Gebrüder Ruegg, Uster, Switzerland. [Vol.64,p.143E.]

The small hand or belt-driven machine illustrated is for producing keyways up to 1¾ in. wide and 12 in. long, without shifting the work. The bed carries a cutter head on slides with its longitudinal motion by screw, and on the front at any desired position are fastened V-blocks which secure the work.

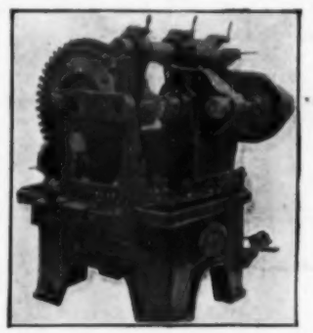
The cutter spindle is driven direct, the longitudinal motion being driven either direct by hand or by clutch-controlled gearing driving a worm with wormwheel and nut combined. In applying the cut the spindle is moved bodily forward by means of a nut carried on a threaded boss on the spindle head. An appliance of much the same type is available for milling teeth in gears of nearly 12-in. maximum diameter, and of ¾-in. maximum pitch, the necessary division plates being provided.

—50—

Milling Machine, Rotary, Special

Oldfield & Schofield Co., Ltd., Halifax, England. [Vol. 64,p.157E.]

The rotary milling machine here illustrated is for dealing in mass with small articles which require machining to standard, such as small eyebolts and forks, one working in conjunction with the other.



The forms are made from 1-in. square bright steel with a circular shank turned about 3 in. long. These shanks are inserted in holes provided all around the rotary workplate and locked thereto by draw bolts and nuts. A milling cutter $\frac{7}{16}$ in. wide passes through all the forks, removing the middle from the solid, the time occupied in cutting each fork being about one minute.

The machine operates continuously. The one speed provided gives a cutting speed of 55 ft. per min. with a 6-in. cutter. The rates of feed provided are 3, 6 and 9 in. per min. The rotary workplate is driven through two sets of worm reduction

gears, the wormwheel for the final drive being bolted directly to the back, and an outer stay locks the work-spindle to the cutter head, eliminating shock. A dropping worm trips the feeds. The machine occupies a floor space 4 ft. 3 in. square and is 3 ft. 10 in. high. The approximate weight is about 3,700 pounds.

Planers

— 51 —

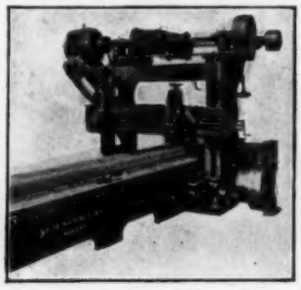
Planer, Light-Duty

White Machine Tool Co., Ltd., Halifax. [Vol.63,p.258-E.]

The motor-driven double-belt planing machine is of a large capacity adapted for light duty. It will plane work 4½ ft. wide, 3 ft. high and 20 ft. long, the bed being 33 ft. long and 22 in. deep, with V-ways 2 ft. 4 in. apart.

The machine carries two toolboxes on the cross-slide and has provision for a side tool box on the front housing. The first two gear reductions in the bed are double-helical. All gears and racks are of steel. The table rack fits between lips and is bolted and dowel-pinned to the table, the bolts having lock nuts. Supplementary side flanges prevent side lift of the table. The tool boxes are of the offset type. The down motion to the slides is actuated through spirals and the screw has a ball thrust bearing and phosphor-bronze nut.

The loose pulleys are bronze-bushed and run on cast-iron bearings carried from the main brackets. The drive is by 12½-hp. constant-speed motor, mounted on a bracket bolted to the left-



hand housing, through a four-speed cone-driven, self-contained countershaft. The cone diameters range from 16 to 11½ in. for belts 4½ in. wide. All bearings are of the ring-oiled type. The motor is coupled direct to the first driving shaft which carries at its outer end the return driving pulley. The four cutting speeds are from 31 to 60 ft. per min., with return at 100 ft. per min. The pulley shaft is hollow and all its bearings are automatically oiled by centrifugal action through radial holes to felt pads. The other bearings are oiled through copper pipes, the supply being from a central point.

The machine occupies a floor space of 42x7½ ft., its total height being 8 ft. and 9 in. The weight of the machine is 14½ tons.

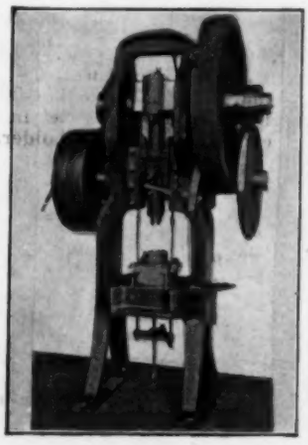
Presses

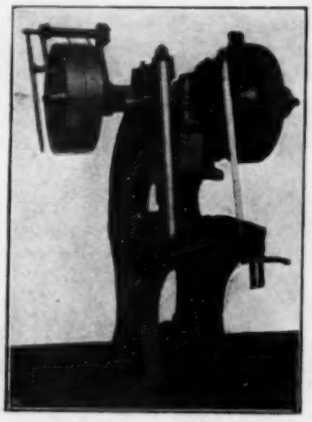
— 52 —

Presses for Hot Working

Taylor & Challen, Ltd., Birmingham, England. [Vol. 64,p.32E.]

The demand for plastic material hard pressed into various wireless components has led to the development of the No. 705 hot-working press. It is a single-action, crank-operated machine, with a punch stroke of 8 in., and with space of 20 in. between uprights of frame for tools, the capacity depending entirely on the size and class of material and the time of dwell necessary for the purpose. The machine stops at the bottom of the stroke with full pressure on. A compensating connecting rod is fitted which will allow for small variations in the amount of material used, and also follows up the contraction of material due to the pressure.





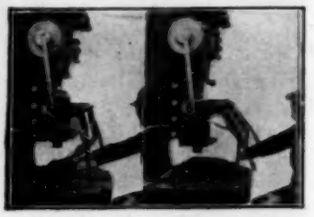
The production of hot brass pressings can be done on a No. 370 geared press illustrated. This press operates at about 50 to 60 strokes per minute.

— 53 —

Guard, Pull-Out, for Presses

J. P. Udal, Upper Dean St., Birmingham, England. [Vol.64,p.17E.]

A pull-out guard for presses is being made by this company. For small presses the guard is preferably driven



by a crank-pin mounted on the free end of the crank-shaft, the drive being by link mechanism off the press slide in the case of larger presses.

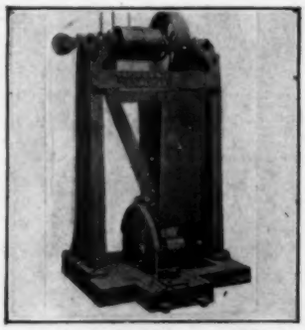
Other Machine Tools

— 54 —

Sawing Machine, Swing 46-In.

Carter & Wright, Halifax, England. [Vol.63,p.280E.]

The 46-in. diam. swing sawing machine has been designed for sawing to length hot sections up to 12 in. in diam., as they leave the rolling mills.



Two standards of box section carry at the top trunnion bearings which support the swing frame. The driving shaft passes through clearance holes in the trunnion bearings and runs in ring-oiled bearings bushed with gunmetal. The saw is mounted on a large flange formed on the saw spindle and can be quickly removed.

The floor space occupied is 7 ft. and 6 in., by 7 ft. and 4 in., while the total height is 12 ft. A motor of 25 hp. is required to drive the machine, which weighs approximately 6½ tons.

— 55 —

Gear Generator 6-Inch

J. Holroyd & Co., Ltd., Milnrow, England. [Vol. 63,p.173E.]

The gear-generating machine illustrated has a cutter that reciprocates and revolves while the work revolves. It will produce spur gears both internal and external up to 6 in. in diam. and down to ¾ in. in diam., internally. The maximum width of face of

gear produced is 1 in. and the maximum pitch is 8 d.p. in cast iron.

The rotating motion to the spindle is obtained from gearing through change wheels, the horizontal reciprocating motion also being derived from change wheels driven by the main shaft. The cutter head has a cross adjust-

ment by hand with dead stops which can also be adjusted, the movements having micrometer settings. The stroke of the cutter spindle is obtained from a crankdisk which operates a pinion and rack on the spindle sleeve. This movement is adjustable.

The work is carried on a steel spindle which revolves by worm gearing. The workhead has a small swivelling movement operated by a cam and bowl, with eccentric adjustment for giving the necessary relief to the cutter, and a dead stop is provided for the working stroke. The drive is by fast and loose pulleys.

The machine occupies a floor space of about 4 ft. 3 in. x3ft. 4 in. and the net weight is about 2,350 pounds.

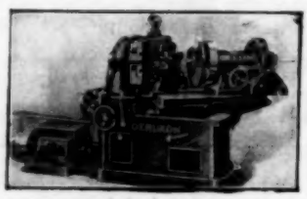
— 56 —

Bevel-Gear Planer, Improved

Machine Tool Works, Oerlikon, Switzerland. [Vol.64, p.43E.]

The improved bevel-gear planers made by this company are listed in a range of five sizes, the smallest taking maximum diameters of 14-in., the maximum length of tooth cut being 4¾-in. The machine has 8 cutting speeds and 10 rates of feed and requires 3 hp. for driving. The weight is 5,720 lb. Similarly the largest machine will admit 78¾ in. in diam., the maximum length of tooth cut being 13¾ inches.

With 8 cutting speeds and 16 feeds, the machine takes 10 hp. for driving purposes. The total weight is 44,090 lbs. The machine works with a



shaper action, two tools being used simultaneously on the tooth flank. The dividing principle is used, the teeth being cut one after the other, and the spaces can be gashed at high speed by special tools.

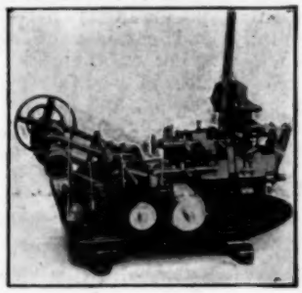
— 57 —

Pinion-Cutting Machine, Automatic

Selson Engineering Co., Ltd., Charles St., London, E. C., England. [Vol.64,p.88E.]

This company has introduced a new machine for the automatic production of pinions used in such work as gas, electric and water meters. The machine illustrated is available in two sizes. On the smaller, pinions from ¼ to ⅝ in. up to 26 diametral pitch can be cut, while the larger machine handles pinions from ¼ to 1 in. in diam. up to 12.7 diametral pitch. Pinions can be cut in brass, nickel, steel or other material, the necessary feed changes being available.

When desired, the machine can be operated as a semi-automatic, chucking being effected by hand. In principle the machine has a horizontal



reciprocating slide which carries the work and a dividing mechanism and a milling cutter spindle carried by a vertical slide. Immediately prior to the cutting stroke of the workslide the milling spindle travels down to the correct depth of tooth, and moves upward on the return stroke. This operation is repeated for each tooth as indexed.

The weight of the larger machine on legs is 703 lb., and of the smaller machine 192 pounds.

— 58 —

Axle Ending and Centering Machine

Armstrong, Whitworth & Co. Ltd., Openshaw, Manchester, England. [Vol.63,p. 268E.]

An axle ending and centering machine recently introduced by this company has a bed which is mounted on standards and which carries the slides, centering heads and driving headstocks, and

the machine will deal with axles 10 in. in diam. by 9 ft. long as a maximum, or 5 ft. 9 in. long as a minimum.

The drive is by a 15-hp. motor which, if of variable speed type, can run at between 300 and 900 r.p.m.

Two centering heads, driven by separate motors, are fitted on slides at the back of the saddles. These motors are each of 1½ hp. running at 1,350 r.p.m. Each head has two spindles, one for drilling the center hole and the other for countersinking the drilled hole.

The machine weighs approximately 12 tons, with variable-speed motor or 12½ tons with a constant-speed motor running at 750 revolutions per minute.

Other Machines

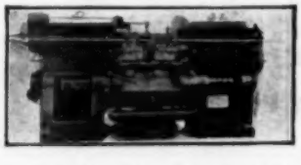
— 59 —

Boring and Turning Machine, Double-Headed Semi-Automatic, Four-Spindle

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.64,p.148E.]

The illustration shows a double-headed four-spindle semi-automatic boring and turning machine. This machine can also be furnished with a single head if desired. The work is stationary, the tools being carried in holders and rotating around the job. The disk-form turret carries five chucks on each side, with four toolholders operating on each side, leaving one vacant station for loading.

The machine is designed for automatically machining small stampings and forgings, each chuck taking up to 3¼ in. diam., while boring, turning and facing can be done up to 2¼ in. in diam. The drive is by a single pulley from the lineshaft, or by motor, the motor being mounted on the floor and driving through silent chain. The turret is indexed by



means of a Geneva stop, the motion being transmitted through spur gears from the main camshaft. A spring-loaded safety device prevents breakage due to obstructions. A geared coolant pump is driven by chain from the main shaft, the coolant being fed through a hole in the center of each toolholder.

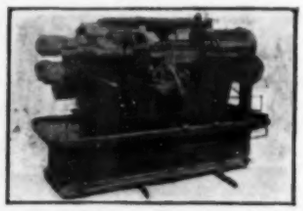
— 60 —

Automatic, Four-Spindle

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.64,p.148E.]

In the four-spindle automatic, illustrated, in which the work is revolved and indexed in rotation to the various stations, the tools are held stationary. The machine can be supplied as a full automatic for bar work, the automatic chuck taking 2¼-in. bars, or as a semi-automatic chucking machine with three spindles for tooling and the fourth spindle for loading and unloading. This spindle can be started and stopped independently.

As a chucking machine the capacity is up to 2¼ in. in diam., air chucks increasing



this to 4 in. in diam. The maximum length turned is 7 in. The camshaft is driven from two sources. One provides for the feed of the tool, the feeds being determined in this case by change gears carried in a box at the rear of the machine. A separate adjustable stop is provided to control the feed both of the front and rear slides to each spindle. These stops are automatically brought into position by the rotation of the spindle carrier. A tapping spindle is provided, while provision is also made for drilling and reaming spindles. Two lubricating pumps are fitted, one for the spindle bearings, the other for the necessary coolant to the tools.

— 61 —

Flexible-Shaft Unit, "Flextol"

S. H. Morden & Co. Ltd., 18 *Dartmouth St., Westminster, S. W., England.* [Vol. 63,p.219E.]

In the "Flextol" power-driven hand tools, a flexible shaft is employed. The speed reducing unit is combined with the tool, thus permitting the shaft to be the high speed

member. The clutch is embodied in the tool itself. The drive permits the bit to be in line with the flexible shaft. The same members act as clutch and speed reducing unit, hardened steel taper friction rollers being used. A central sun roller is con-

nected to the flexible shaft and rotates at motor speed. A set of three planet rollers is carried in a cage.

The hand pressure necessary for screw driving, etc., is sufficient to engage the planet rollers with the sun roller, which thus drives the tool at 280 r.p.m. Ball bearings take the thrust while a spring and ball located at the end of the sun roller disengages the drive immediately after the pressure is released. The tool is suitable for screw driving, nut setting, drilling and valve grinding. Holes up to ½ in. in diam. can be drilled in mild steel and cast iron. For drilling, a trigger attachment enables the planet cones to be pushed into engagement by thumb pressure. This permits a more sensitive feed.

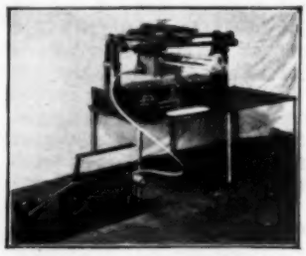
— 62 —

Cutting Machine, Oxygen-Jet Automatic

Godfrey Engineering Works, Wood Green, N., England. [Vol.63,p.175E.]

The automatic oxygen-jet cutting machine illustrated is available in three styles as a bench machine; portable, as shown; or mounted on runners so that it can be moved on the plate to be cut. The head carrying the blow-pipe moves on slides at right angles formed by bars, and, in addition, a bracket on top of the machine will hold a templet around which a roller moves, the blow-pipe thus being enabled to reproduce any required form on the work.

An electric motor drives a disk by belt, the face of the disk in turn driving a roller which is carried on a slide so that the effective radius of



the disk, and consequently the speed of rotation of the roller, can be varied as desired, an indicator on the speed box showing the cutting speed resulting at each position. The motion of rotation is then transmitted by a flexible shaft to a spindle carried in the head.

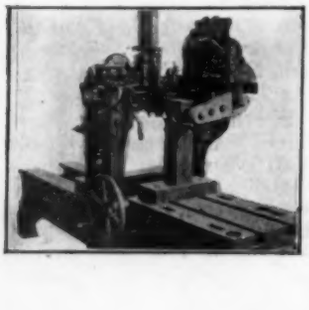
Measuring, Gaging and Testing Equipment

— 63 —

Testing Machine, Hardness, Brinell, with Grinding Attachment

Armstrong, Whitworth & Co. Ltd., Openshaw, Manchester, England. [Vol.63,p.217E.]

The improved hardness



testing machine works on the Brinell principle. The surface to be tested can be prepared by means of a self-contained electrically driven grinding wheel. The wheel is moved across the job which is supported on a horizontal table.

The depression produced by the test can be read by microscope, and the machine is suitable for metal of all kinds from ¼ in. thick up to 18 in. Hydraulic pressure is exerted on a piston which, at its lower end, carries a ball, and the size of the ball to be employed varies according to the load to be applied, so that a 1/16-in. ball will take a load of 1,500 lb., and a ⅛-in. ball of 6,000 lb., as a standard.

— 64 —

Chain-Testing Machine, 1-Ton

A. J. Amsler & Co., Schaffhouse, Switzerland. [Vol.64, p.151E.]

The chain-testing machine illustrated is used for applying a definite tensile load to

jointed chains in finished lengths as usually made. The machine is arranged horizontally and consists of a bench carrying on the right a screw which is used to produce the tension, and on the left a device for measuring this tension.

The net weight of the machine is about 330 pounds.

— 65 —

Rotoscope, "Ashdown"

Autocar Auxiliaries Ltd., Letchworth, England. [Vol. 63,p.256]

The "Rotoscope" can be used for engineering purposes in the observation and measurement of mechanical motion of machines and for the study of the influence of loads and speeds on machine details. It is stroboscopic in principle, the object being "glimpsed" almost instantaneously.

It consists of a special shutter through which the object is viewed, and a spring motor by means of which shutter speeds ranging from 50 to 20,000 per min. can be obtained. The shutter is formed by a light cylinder of brass tube ⅞ in. in diam. x 4 in. long, rotating horizontally and weighing 1¼ oz. Across this, in slots, 1/16x1¼ in. are placed vanes 0.005 in. thick. If these compounded slots are arranged in two planes at right angles to each other, double the speed is obtained.

The instrument is contained in a box and weighs 7 lb.

— 66 —

Pyrometer, Radiation, Improved

Bowen Instrument Co., 9 Newton Road, Leeds, England. [Vol.63,p.238E.]

This company has developed a self-contained, portable, fixed-focus, radiation pyrometer, reading direct in temperature degrees, in which an objective lens is employed in place of the usual mirror, for concentrating the radiant heat and the sensitive ele-

ment, which is a minute thermocouple.

The lens is of clear quartz 1¾ in. in diam. The radiation thermocouple consists of an extremely thin wire secured to a thicker supporting wire, a receiving disk fixed over the joint improving the radiation reception.

Material Handling

— 67 —

Hoists, Pneumatic, "Bradford"

United States Metallic Packing Co., Ltd., Bradford, England. [Vol.63,p.255E.]

The "Bradford" air hoists are of the balanced pressure type, and suitable for delicate duty. Compressed air is admitted to both sides of the piston, and prevents sudden movement or jerks. The load is raised by exhausting air from the upper side of the piston and lowered by permitting air to pass, through the piping provided, from the under to the upper side of the piston.

When required for stationary use, the hoists can be provided with brackets for

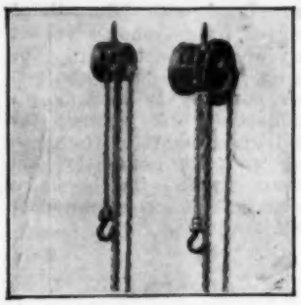
bolting in position or can be suspended from a hook or eye-bolt. When required to transport a load, suitable trolleys to run on the lower flanges of rolled steel joists afford the requisite facilities. When forming part of a travelling crane, the hoist is suspended from a cross girder, on which it moves by means of a trolley, and the girder is similarly travelled on joists by other trolleys actuated through gearing by a hand chain.

— 68 —

Pulley Blocks, All Steel

Universal Machine Molding & Machinery Co., Ltd., 79 Queen Victoria St., London, E. C. England. [Vol.64, p.143E.]

The all-steel pulley blocks marketed by this company are manufactured by Bonvillain and Ronceray, Choisy-le-Roi, near Paris. The blocks have straight-cut



gears, of steel, case-hardened, and the side frames are made from rolled steel plates.

The blocks are available in a number of sizes, with capacities ranging from ½ up to 20 tons, and all are tested to 50 per cent above normal load. In blocks with capacities above 3 tons the hook is fixed to forged steel, not cast steel, the lifting hook and brackets for the hooks and those for the lower assembly being of rolled steel supported by machined steel parts, fitted in and riveted.

Woodworking Machinery

— 69 —

Sander, Belt

Dominion Machinery Co., Ltd., Halifax, England. [Vol.64,p.6E.]

The belt sander illustrated has a fine handscrew adjustment for the sanding belt. The two pulleys are supported in double bearings, one on each side of the machine. The worktable is adjustable vertically, and a dust cover or hood has been introduced. Dustproof ball bearings are now fitted. Each

side of the pulley can be separately adjusted. The two pulleys are 8 in. in diameter.

The worktable can be adjusted about ½ in. vertically to allow the belt to stand a little higher than the pulleys when sanding hardwood, and also for dealing with long patterns. The table is 22½ in. long by 9½ in. wide and the sanding belt is 9½ in. wide. The machine has fast and loose pulleys 8 in. in diam. and 2¾ in. wide.

Complete with fence and dust guard, the machine weighs 308 pounds.

— 70 —

Sander, Belt, Power-Feed

Haighs (Oldham) Ltd., Oldham, England. [Vol.64, p.154E.]

The belt sander illustrated is manufactured in two sizes. It has a power feed which is effected by three rubber-covered rollers, driven by gearing, while spring pressure is applied to each of the rollers.

The sanding belt is carried on pulleys having ball and roller bearings, one being arranged to swivel for quickly tracking and tensioning the belt. A pyramid-shaped pad beneath the belt can be adjusted to give the desired cut.

The sanding belt has a velocity of 2,500 ft. per min. If desired, it can be made with one half for roughing and the other half for finishing. An exhaust fan can be coupled when required.

The sander is self-contained and is built in two sizes, taking timber 24x3 and 30x3 in., respectively and of any length from 9 in. upward. The net weight of the larger machine is 3,920 lb., and of the smaller 3,360 lb., the power required being, respectively, about 7½ and 10 horsepower.

Small Tools

— 71 —

Reamer, Adjustable

Brooke Tool Manufacturing Co., Ltd., Greet, Birmingham, England. [Vol.64,p.18-E.]

In this company's reamer the adjustment is for wear rather than for increase of range. The reamer is of cru-

cible cast steel, with the cutting end hollow and split, the adjustment for diameter being effected by means of a nut with a coned end bearing against the coned extremity of the reamer bore.

The reamer can be had with flutes cut straight or spiral, right -or left-hand. The 36 sizes listed range from a reamer ⅛ in. in diam., with a 1-in. length of flute, up to 3½ in. in diam. with a 4-in. length of flute.

— 72 —

Reamers, Adjustable, Inserted-Blade

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.64,p.124E.]

A complete line of inserted-blade adjustable reamers was recently produced by this company. The minimum and

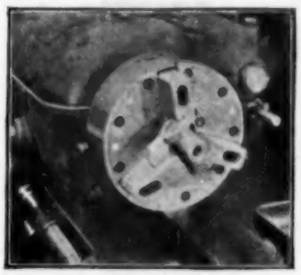
maximum sizes are 1 in. and 6 1/16 in. in diam. The reamers are for use in general shop work.

— 73 —

Chuck with Special Jaws, "Coventry"

Alfred Herbert, Ltd., Coventry, England. [Vol.64,p. 52E.]

The accompanying illustration is of the "Coventry" concentric chuck, and shows it holding a valve body to be bored. The chuck is the 9-in. size. Two of the jaws are stepped, each to take one side of the hexagon boss at the end of the work piece, the



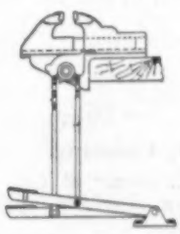
opposite side of each hexagon being gripped by a supplementary jaw. The last is held in the third jaw of the chuck itself, this being slotted and a pin provided so that the supplementary jaw can swivel and thus compensate for any unevenness in the casting.

— 74 —

Vise, Pedal, Controlled

Hegi & Co., Overbourg, Switzerland. [Vol.64,p.143 E.]

In the parallel vise of this company the gripping and release actions are provided by pedals, the hands of the workmen being free. The work is placed in the vise,



the loose jaw being pressed upon if necessary by the operator's body, and the grip results from foot pressure.

Miscellaneous Equipment and Supplies

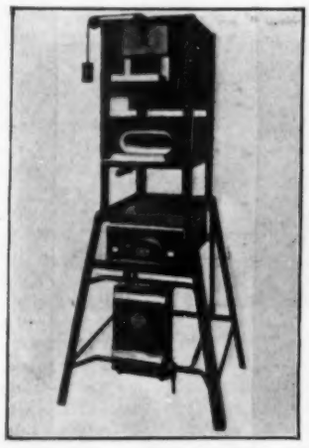
—75—

Furnace, Electric, for High-Speed Steel

Automatic & Electric Furnaces, Ltd., Farringdon Road, London, E. C., England. [Vol.64,p.14E.]

The high-speed electric furnace has a hardening chamber measuring 9x5x3 in. In the roof are two carborundum rods, which supply the necessary heat. A counterbalenced rise-and-fall door has a spy-hole.

Immediately below the hardening chamber is the preheating chamber, consist-



ing of a resistance-wound muffle which requires no temperature regulation. The temperature of a muffle is kept at about 750 deg. C. Below the muffle is a tray to take the work, tongs, etc., and underneath this is the resistance for regulating the temperature of the high-speed steel hardening chamber and the preheating chamber, arranged to allow quick temperature control. At the base of the complete furnace are the main switch and fuses.

The time taken to reach 1,200 deg. C. and 750 deg. C., respectively, is about one hour from cold.

—76—

Barrel, Coloring

E. H. Druce & Co., Ltd., Coventry, England. [Vol.64, p.69E.]

The barrel illustrated is for blueing or coloring small articles, such as rollers, chain components, carburetor parts,

piano pins and wrenches. Between the inner and outer case of the outer barrel is a lining of asbestos, and inside is a barrel forming a work pan on which a gas jet plays.

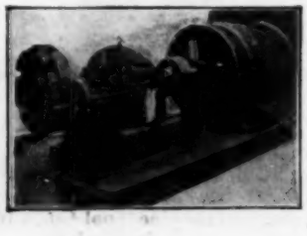
The barrel is driven by a clutch-controlled pulley and worm gearing at from 60 to 120 r.p.m., according to the material under treatment and the time allowed. Material of any kind which can withstand the heat can be treated. The usual working temperature is 250 deg. C. The gas supply can be regulated, the gas consumption being at the rate of about 175 cu.ft. per hour for 100 lb. of material or 250 cu.ft. for 200 lb. The time required for coloring plates 0.037 in. thick is 1 hour, or for plates 0.2 in. thick 2 hours.

—77—

Speed-Increasing Gear, Double-Helical

Crofts (Engineers) Ltd., Bradford, England. [Vol.63, p.198E.]

A speed-increasing gear set has been used to connect a Diesel engine running at 250 r.p.m. to a 50-kw. electric generator which is driven at 700 r.p.m. The increase in speed is effected by double-helical gearing in the required ratio inclosed in a cast-iron casing. The engine drives this through a Croft rim friction clutch with slip-



pers lined with "Sure-Grip" fricton lining, shown at the left of the illustration. The firm's "Crown-Pin" type flexible coupling is used as the connecting link between the high-speed shaft of the gearing and the generator; the latter, with the set, is mounted on a combination bedplate.

—78—

Jigs, Motion, for Locomotive Construction

Armstrong, Whitworth & Co., Ltd., Openshaw, Manchester, England. [Vol.63,p. 227E.]

This company has built jigs for use in the motion fitting shop for the inside and outside motions of locomotive running gears. The bottom and vertical plates are square to each other and form a square from which the alignment of the detail can be checked. The vertical plates are drilled to correspond with the engine frame and the cylinder and girder stays are assembled and set in their respective positions. The rear cylinder cover is then put in

position and the slidebars and liners are fitted and lined through. The piston and crosshead are tried in, and the packing is adjusted. The steam chest cover and piston valve are then assembled and finally the link motion is connected up complete, using a dummy revolution shaft.

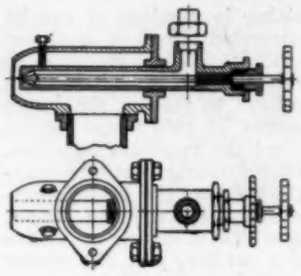
These jigs serve the threefold purpose of adjusting and inspecting the motion as an assembled unit, lessening the work in the erecting shop and insuring a complete delivery of items as they are required in the shop.

—79—

Burners, Oil-Fuel, Improved, "Alcosa"

W. Allday & Co., Ltd., Paradise St., Birmingham, England. [Vol.64,p.54E.]

The improved "Alcosa" oil-fuel burner has an air connection 2½ in. in diam. with an oil connection ¾ in. in diam., the air pressure being 10 in. to 5 in. w.g. The diam-



eter of the nozzle is 1¼ in. and the oil consumption is from 2 to 6 gal. per hour.

The oil flows through an inner body and the air through the outer body. The two bodies are independent and by adjustment of their relative position the air pressure is controlled at the nozzle. The oil supply is controlled by means of a needle valve.

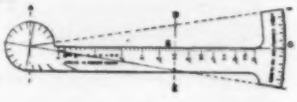
Any fuel oil, crude or refined, can be used and can be fed to the burners by gravity or by pressure.

—80—

Computer, Area

Norton & Gregory, Ltd., Castle Lane, Buckingham Gate, London, S. W., England. [Vol.64,p.125E.]

This company has designed an instrument for computing areas of planes, sections, diagrams, etc. It is based on the fact that the area of a triangle is equal to half the product of the base and the perpendicular height. It is available in transparent celluloid with plain edges or in electrum with bevelled edges and the angle at the apex is 18 deg. In use, it is pivoted around point *A* and the area inclosed between this point and the two sides of the triangle up



to any given point is shown on the scale. Thus, at *B* it will be seen that the area of the triangle *ADE* is 2¼ sq.in. The whole area is thus measured by successive positions of the instrument, these positions being set by means of the outer limb *C*. The readings are then added together and show the actual area of the figure in square inches. This, in the case of a plan drawn to scale, can be converted to the area of the actual space represented by multiplying by the scale squared.

European Edition

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Small electrically-driven drill	7	137
Carter & Wright, Halifax, England		
All-gear head universal miller	45	143
Swing sawing machine, 46-inch diameter	54	144
Crofts (Engineers) Ltd., Bradford, England		
Double-helical speed increasing gear	77	148
Cunliffe & Croom, Ltd., Manchester, England		
Carding engine cylinder lathe	38	141
Dean, Smith & Grace, Ltd., Keighley, England		
Surfacing and boring lathe, 36-inch	32	141
Dominion Machinery Co., Ltd., Halifax		
Belt sander	69	147
Dowding & Dickinson, Windsor House, Victoria St., London, S. 10, England		
"Pfauter" automatic hobbing machine	22	139
Dowdings' Machine Tool Co., Ltd., Bush House, Aldwych, London, W. C., England		
Automatic spline and slot miller	48	143
Druce & Co., Ltd., E. H., Coventry, England		
Coloring barrel	76	148
High-speed sensitive drilling machines	11	137
Gebrüder Ruegg, Uster, Switzerland		
Hand-driven keyway-cutting machine	49	143
Godfrey Engineering Works, Wood Green, North, England		
Automatic oxygen-jet cutting machine	62	146
Haighs (Oldham) Ltd., Oldham, England		
Belt sander with power feed	70	147
Boring headstock, 10½-inch	2	136
Heap & Co., Ltd., Joshua, Ashton-under-Lyne		
Tangential-die screwing machine	37	141
Hegi & Co., Overbourg, Switzerland		
Pedal-controlled vise	74	147
Herbert, Ltd., Alfred, Coventry, England		
"Auto" lathe, No. 2A	34	141
Capstan lathe, No. 4B	36	141
"Coventry" chuck with special jaws	73	147
Hexagon turret lathe with covered bed	33	141
"Lumsden" vertical surface grinder	19	139
Overhead tool support for "Auto" lathe	44	142
Reversing tapper, ¼-inch	18	138
Stud and bolt lathe	35	141
Hetherington & Sons, Ltd., J., Manchester		
Radial drilling machine, 4-foot	13	138
Holmes & Co., H., Halifax, England		
Center lathe, 8½-inch	27	140
Holroyd & Co., Ltd., J., Milnrow, England		
Duplex drilling machine, 3-spindle	10	137
Duplex-head drilling machine, 18-spindle	9	137
Gear generating machine, 6-inch	55	144
Vertical cylinder-boring machine	4	136
Hulse & Co., Ltd., Manchester, England		
Duplex car-wheel lathe	41	142
Lang & Sons, Ltd., J., Johnstone, England		
Axle boring and facing machine	39	142
Machine Tool Works, Oerlikon, Switzerland		
Horizontal boring machine	3	136
Improved bevel gear generator	56	145
Midgley & Sutcliffe, Bradford, England		
Radial drilling machines	14	138
Milnes, Henry, Bradford, England		
Small horizontal milling machine	46	143
Mitchell & Co., Ltd., D., Keighley, England		
Center lathe, 12½-inch	28	140
Morden & Co., Ltd., S. H., 18 Dartmouth St., Westminster, S. W., England		
Power-driven hand tools	61	145
Norton & Gregory, Ltd., Castle Lane, Buckingham Gate, S. W., England		
Area computer	80	148
Oldfield & Schofield Co., Ltd., Halifax		
Cam-grinding machine	25	139
Special rotary miller	50	143
Redman & Sons, Ltd., C., Halifax, England		
Crankshaft lathe, 27-inch	30	140
Scott Bros., Ltd., Halifax, England		
Turning and boring lathe	40	142
Selson Engineering Co., Ltd., Charles St., London, E. C., England		
Automatic pinion-cutting machine	57	145
Smith & Coventry, Ltd., Salford, Manchester		
Duplex turning and boring mill, 30-inch	5	136
Improved universal relieving lathe	42	142
Swift & Sons, Ltd., G., Halifax, England		
Duplex boring machine	6	136
Motor-driven wall radial drill	16	138
Taylor & Challen, Ltd., Birmingham, England		
Presses for hot working	52	144
Town & Sons, E., Halifax, England		
Radial drilling machine, 6-foot	15	138
Turner Tool Manufacturing Co., Shadwell St., Birmingham, England		
Large linisher machine	24	139
Udal, J. P., Upper Dean St., Birmingham, England		
Pull-out guard for presses	53	144
United Machine Tool Co., Ltd., Gray's Inn Rd., London, W. C., England		
Precision manufacturing lathe	31	140
United States Metallic Packing Co., Ltd., Bradford, England		
"Bradford" pneumatic hoists	67	146
Universal Machine Moulding & Machinery Co., Ltd., 97 Queen Victoria St., London, E. C., England		
All-steel pulley block	68	147
Wadsworth & Co., L. H., 57 Denbigh St., Pimlico, S. W., England		
Universal milling attachment for lathe	43	142
Ward, Haggas & Smith, Keighley, England		
Motor-driven all-geared milling machine	47	143
White Machine Tool Co., Ltd., Halifax, England		
Light-duty planer	51	144

News of the Week

Dr. Millikan Awarded A.S.M.E. Medal at Spring Meeting in San Francisco

Five hundred delegates and guests witness scenic wonders of the West, visit plants, and participate in program

In recognition of his contributions to science and engineering, Dr. Robert A. Millikan, head of the California Institute of Technology, and a recipient of the Nobel prize, was awarded the A. S. M. E. medal at the spring meeting of the society, held June 28 to July 1, in the Palace Hotel, San Francisco. The presentation was made by W. L. Abbott, president of the society. Dr. Millikan's responsive address dealt with the subject, "Atomic Mechanics." The award was made at the banquet, at which Warren H. McBryde, chairman of the San Francisco section, was toastmaster. The other speaker of the evening was William Sproule, president of the Southern Pacific Co. The title of his address was "Engineers—The Advance Guard."

One hundred and sixty of the 500 delegates and guests reached San Francisco on a special train from the East, which left New York City on June 14, and picked up Middle-Western delegates en route. Stopovers were made in Chicago, Kansas City, Denver, Colorado Springs, Santa Fe, Albuquerque, Grand Canyon, San Bernardino, Riverside, Los Angeles, Merced and Yosemite Valley. After leaving San Francisco the party will visit Shasta Springs, Portland, Mt. Ranier, Seattle, Victoria, Vancouver, Revelstoke, Lake Louise, Banff, Winnipeg, Minneapolis and Niagara Falls.

Visit Industrial Plants

Eastern delegates were impressed by the size and accomplishments of the industrial plants in the San Francisco and Oakland districts. They were conducted through the plants of the Western Pipe and Steel Co., A. Lietz Co., Illinois-Pacific Glass Works, Simmons Bed Co., Bethlehem Shipbuilding Co., and the Caterpillar Tractor Co. Other plants were inspected by special parties, among them the Link-Belt-Meiss & Gottfried Co., Pelton Water Wheel Co., Pacific Gear and Tool Works, Ford Motor Co., Standard Oil Co., California-Hawaiian Sugar Refining Corporation, Hall-Scott Motor Car Co., Magnavox Co., Columbia Steel Co., Durant Motors Co., Chevrolet Motor Co., and the Pacific Coast Steel Company.

Excursions aside from business included a trip to Mt. Tamalpais and Muir Woods on the most crooked railway in the world, a steamer trip on San Francisco bay, an auto tour of San Francisco, a trip on East bay, special shopping trips for the ladies, and a trip to the University of California. A reception and dance was one of the outstanding social events.

W. L. Abbott presided at the business session, which opened the meeting. The following standards were read by title: Small Rivets; Tinners, Coopers and Belt Rivets; Wrench Head Bolts and Nuts; Track Bolts; Round Unslotted Head Bolts; Plow Bolts; T-Slots and Parts; Gib-Head Taper Keys; Plain Taper Keys; Spur-Gear Tooth Form; Steel Pipe Flanges and Flanged Fittings; Methods of Gaging and Specifications for Plain Limit Gages.

At the petroleum session W. R. Eckart, professor of mechanical engineering, Leland Stamford University, presided. D. H. Atherton, assistant professor of mechanical engineering, University of California, presented a paper, "Fluid Flow in Pipes of Annular Cross-Section." B. N. Broido, chief engineer, industrial department, Superheater Co., New York, presented a paper, "Mechanical Engineering in Cracking, Heating and Cooling of Oil." F. L. Kallam, Jr., superintendent Mutual Gasoline Co., Los Angeles, Calif., presented a paper, "The Termination of Charcoal Tests."

Frank B. Drake, president of the Johnson Gear Co., San Francisco, presided at the session on industrial training and education. There were two papers, "The Growth of University Training of the Non-College Type for the Industries of the West," by John L. Kerchen, director of workers' education for the extension division of the University of California; and "Education and Training of Apprentices on the Pacific Coast," by Paul Eliel, director industrial relations department, Industrial Association of San Francisco.

At the fuel and railroad session, presided over by C. L. Cory, dean of the College of Mechanics, University of California, three papers were presented: "Combined Oil-and-Gas-Burning Furnaces for Power Plant Use," by J. Grady Rollow, electrical engineer, Los Angeles Gas and Electric Corporation; "Fuel Oil for Railways," by J. C. Martin, Jr., J. C. Martin & Co., San Francisco; and "The Development of the 'Caterpillar' Tractor and Its Application to Industry," by Pliny E. Holt, vice-president and director of engineering, Caterpillar Tractor Co., Stockton, California.

Among the papers presented at the hydraulic session and the oil and gas power sessions were "Speed Changes of Hydraulic Turbines for Sudden Changes of Load," by Earl B. Strowger, Niagara Falls Power Co., Niagara Falls, N. Y., and S. Logan Kerr, Jr., assistant hydraulic engineer, Wm. Cramp and Sons Ship and Engine Building Co., Philadelphia; and "Uniform Methods of Calculating the Periodic Displacement and Oscillations in Synchronous Machines," by C. W. Cutler, industrial engineering department, General Electric Co., Schenectady, N. Y.

In connection with the meeting there was an exhibit of the "Southern Pacific" type, three-cylinder locomotive, built by the American Locomotive Co.

Mr. Holt's paper on the "Caterpillar" tractor was largely historical, a feature of value in that it served to point out why the tractor must be a well-made machine. With reference to the demands for quality and accuracy, Mr. Holt said, in part:

"The successful tractor of today must be one of the most carefully designed and well-balanced pieces of machinery possible to produce. After a moment's thought it will be realized why this is the case. A tractor has to endure much greater abuses than almost any piece of machinery of its kind in use today. First, the tractor is uniformly loaded to practically full load at all times. Second, it has to work under the most adverse conditions of dust, dirt, mud, sand, and grit, which will attack its finely constructed working parts through the air intake and breather, and through every moving joint or possible opening, unless thoroughly excluded. Third, the tractor must run year in and year out, and frequently day and night.

"With the progress made in perfecting caterpillars and the work under way on auxiliary equipment, the future of this type of prime mover in industry is assured."

The paper by Mr. Eliel served to give a picture of the difficulties that enter into the education and training of apprentices on the Pacific Coast.

Nominations for officers for 1927 were announced last week by the nominating committee which met in Chicago. Election will be conducted by ballot of the entire membership, closing on Sept. 28, this year. Charles M. Schwab, chairman of the Bethlehem Steel Corporation, was nominated for president. Vice-presidents selected are: Charles L. Newcomb, manager of the Deane Works of the Worthington Pump and Machinery Co.; E. O. Eastwood, professor of mechanical engineering at the University of Washington; Edward R. Fish, of the Heine Boiler Co.

Managers nominated are: Paul Doty, chairman of the Minnesota State Board of Registration; Ralph E. Flanders, manager of the Jones & Lamson Machine Co.; and Conrad N. Lauer, general manager of Day & Zimmerman, Inc. Erik Oberg, editor of *Machinery*, was nominated for treasurer.

The Business Barometer

This week's outlook in Commerce, Finance, Agriculture and Industry based on current developments

By Theodore H. Price
Editor, *Commerce and Finance, New York*

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THE seasonal placidity of business was not seriously disturbed last week. The breezes and showers that are normally alternate in the summertime have helped most crops toward a satisfactory fruition and in so far as our agricultural production is concerned a sufficiency would seem to be assured. The wheat crop promises to be at least 10 per cent over last year.

It is too early to speak positively about it but the outlook thus far is propitious and the belief in an abundant yield of cotton is persistent although the week has seen the first genuine crop scare of the season with the boll weevil and the newly discovered "cotton flea" playing important roles.

But for the farmer it is unfortunate that good crops generally mean lower prices and in the grain states an appreciation of this fact has aggravated the discontent, and pessimism has been prevalent lately.

Otherwise and elsewhere the outlook is satisfactory but there is no denying that a further decline in wheat and corn will restrict the purchasing power of the sections in which they are produced. For this reason those who sell goods in the grain belt are watching the course of the grain market very closely and if a further decline in prices occurs some reduction in distributive trade will probably be seen.

But in so far as the dry goods market is concerned it has held up remarkably well. Cotton fabrics in particular have shown a firmer tone in sympathy with the advance in cotton futures, but the producers of woolen goods got something of a shock when the American Woolen Co. announced that it had reduced its prices on goods for next spring by from 15 to 20 per cent as compared with last year.

These commercial details have not however made much impression upon the stock market where the plethora of money seeking investment continues to be reflected in the active demand for almost anything that pays a dividend.

Good bonds are in fact getting so high that conservative investors are afraid to buy them and in their place the better class of railroad stocks are finding much favor. Concurrently much has been heard of a new "Van Sweringen-Nickel Plate Consolidation" and if it goes through a distinct revival of speculative activity in the "rails" will be quite possible.

Some improvement in the demand for steel and other metals is claimed but it is somewhat elusive and it is plain that there will be less new building during the coming winter than for some years past. The new structures now in process of completion were planned for and financed some time since and when they are finished the demand for office space and residential apartments will be pretty well supplied.

The pessimists have tried to make capital out of the suspension of six or seven small banks in Florida but they seem to have been mushroom concerns and the more responsible institutions appear to be well fortified.

The Florida land boom is nevertheless a thing of the past and with its passing there will be less heard of the fortunes that have been and are to be made in buying real estate. There is no doubt that money is to be made by developing residential property that is near the great American cities but the theory that land is valuable just because it is land has been disproved by recent developments.

But the land booms that have ceased to boom and the strikes that include about 40,000 garment makers and 2,000 subway operators in New York are about the only dark spots in the foreground of the economic picture. There are, however, a few more clouds in the background, if Europe and South America can be so regarded.

In France the anesthesia of inflation seems to have made the people and the government insensible of their financial obligations and unwilling to meet them. As a result the franc has sold at 2.50 and some are now saying that it is not worth saving. If this spirit finds expression in further inaction and the French people become convinced that the enormous holdings of rentes are valueless great distress and very hard times will certainly follow.

Then there is the English coal strike. Still unsettled, it is strangling British trade. Another sinister development is the resistance to Mussolini's nine-hour work-day that the Italian people are manifesting.

It is the first time that the director's authority has been seriously questioned and the world that has come to think of Il Duce as omnipotent is wondering what would happen if he should become impotent or die.

And finally there is the somewhat anomalous situation that has arisen in Brazil whose success in borrowing here and in England has brought about a sudden rise in the price of the millreis and a deflation so precipitate that it has caused the suspension of one bank and much financial and commercial distress.

The episode emphasizes the danger that is inherent in the use of a fiat currency and it may work serious reduction in the purchasing power of Brazil.

But the clouds that are to be discerned overseas are still too far away to cast any shadows in this country and we should continue to be prosperous if we can market our promising crops at good prices. This is America's major problem at present and it is certain to become a political issue during the coming campaign.

What's Doing in Industry

The present market gives great promise of living up to the predictions made a month ago to the effect that summer business in the machinery and machine tool field would hold up firmly and would show a better volume than is ordinarily expected for that season of the year. Dealers and manufacturers in the important industrial centers report increased sales and the inquiry market is active.

In the automotive center around Detroit sales have increased and recently announced expansions by more than one large automobile builder give promise of substantial orders soon. Business has picked up this month in Chicago, most orders being for replacements. Cincinnati reports a fair volume of orders with plenty of inquiries. Small tools and shop equipment are selling in Indianapolis.

Railroads are buying in the New England territory, and good business is being placed by auto accessory and electrical goods manufacturers. The New York market is running smoothly, railroad business being the feature now. General industrial activity and construction work in the South are bringing an improvement in the machinery market. The same may be said of Canada, where steel interests are buying tools.

America's major problem at present is to market her promising crops at good prices. This phase of our economic life is certain to become a political issue during the coming fall campaign.

The Industrial Review

Progress of the machinery and machine-tool business in various parts of the country

THE following reports, gathered from the various machinery and machine tool centers of the country, indicate the trend of business in these industries and what may be expected from the future:

Southern District

Though business as a whole is no less than usual at this season of the year, it has quieted down somewhat the past two or three weeks. Garage equipment and road-building machinery are still active lines, but textile machinery, contractor's equipment, railroad, smaller machine shop and wood-working sales are all showing a slight decline.

As a whole, equipment sales to new industrial concerns are larger than usual at this time because of the large amount of factory construction that is in progress all over the Southeast.

Garage equipment is one of the most active lines right now, and the business is enjoying record proportions, with lathes, cylinder grinders, drill presses, etc., both new and used equipment, all moving actively. As stated, textile machinery is quiet after a fairly good season, but the volume of inquiries is reported unusually heavy, giving promise of a decided increase in this business the next few weeks. Railroads are also inquiring on a fairly good basis and as they have in progress or plan to carry out considerable shop construction in the Southeast the outlook is good, though current sales are quiet.

New England

Railroads continue to be the best buyers of machinery in the New England territory, although in the past week companies engaged in electrical products have been well represented. The buying for the most part has been conditioned on early shipments. Another observation of principal machinery manufacturers is that the automotive industry is buying better. By some the buying, especially in the electrical and automotive branches, is judged to be for expansion purposes. Mid-Western automobile manufacturers are placing orders in this territory. Contract work is also being offered.

In Bridgeport plants are operating on full-time schedules and orders are booked ahead for from three to six months. Special machinery builders are especially rushed in Hartford. Salesman working out of Hartford report good buying in the territory. Dealers in second-hand machinery report continued demand.

Canada

While most branches of the metal working industry in Canada are reported to be doing a flourishing business, there has been a falling off during the last couple of weeks in the demand for machine tools, small tools and shop equipment. This condition, however, is not expected to last very long. Industry on the whole is on the upgrade and there is every indication of a steady demand for tools throughout the summer.

Reports from both western and central Canada are to the effect that new business is reaching the metal-working industry with a steadiness that presages continued demand for supplies. The Algoma Steel Corporation has just received an order for 10,800 tons of rails from the Canadian Pacific Railway for immediate rolling which, together with an order received a couple of weeks ago, makes a total of 26,800 tons. The Western Steel Products, which has received a heavy order from Spillers, Ltd., for sheets for the new mill at East Calgary, Alberta, finds more space necessary and is expanding. The Manitoba Bridge and Iron Works has secured a bridge superstructure contract.

The Dominion Bridge Co. will be kept busy for several months with work on hand, including a variety of bridge steel and building steel orders, and a special order from the Manitoba Paper Co. for extensive building and equipment needs.

In both Montreal and Toronto warehouse business is reported to be excellent, with demand from diversified sources running up monthly totals well in advance of those of the same period last year.

Detroit

Sales of machinery and machine tools in Detroit and southeastern Michigan have shown a slight increase during the past week, and although the volume has not reached the proportions that local dealers would like to have, there are signs that the motor-car plants, always the heaviest buyers of equipment, are planning on extensive purchases.

Inquiries have increased in number, and many engineering staffs are laying plans for revamping some of the departments in leading automotive and accessory plants. The body plants have been in the market for considerable new machinery, while general manufacturing establishments are adding to their equipment.

Production of foundries and rolling mills in the Detroit district is being maintained at a high level, and local machine dealers report better business with this manufacturing line.

It is understood that more than two million dollars worth of machinery for the new Pontiac motor plant at Pontiac has been ordered. At the same time the expansion program of the Chevrolet plant at Flint calls for several million dollars worth of new quipment, not to mention the new buildings themselves.

With the exception of the new blooming mill at the Fordson plant of the Ford Motor Co. no particularly large developments are under way at the Ford plants, but sweeping changes are believed imminent.

New York

The first half of July has brought no appreciable slowing up of machine tool and machinery sales in this market. The present volume is not large, but there is sufficient business to provide most dealers with a fair share. Railroads are quite active and manufacturers of hardware, automobile accessories and electrical goods are buying tools here and there for replacement.

The second-hand market continues to furnish fair business but the scarcity of good used tools at an attractive price keeps the volume below what it might be. Small tools and miscellaneous shop supplies are moving, buying being done on a hand-to-mouth basis in most cases.

A prominent machine tool dealer in this market received an order last week for fifty tools to be used in the new repair shops of the Atlantic Coast Line R.R. at Uceta, Fla. The list included twenty-two lathes of various sizes, wheel and bushing presses, two large steam hammers and a drop hammer. This is one of the largest orders placed recently.

Cincinnati

Taking the season into consideration, there was a fair volume of business in the Cincinnati machine tool market in the past week. Practically all manufacturers and selling agents report a satisfactory reaction from the lull caused by the holiday. The general market tone, it is stated, is better than it was at this time last year.

A fair amount of buying was done by industrial users of machine tools, the greater part of their purchases being for replacement purposes. A number of orders were booked from general machinists, most of these calling for small tools of the high-efficiency type.

A few orders came from concerns in the automotive industries, these calling for single tools for replacement. An increased number of inquiries are coming in from this source and it is thought there will be greater buying before long. Some single tools were sold to railroads for replacement purposes and lists of requirements continue to come in. The remainder of the week's bookings consisted of scattered orders for single tools, from concerns in various lines.

An encouraging number of inquiries came in during the week. These were well distributed over the country, came from all kinds of users and were well diversified as to sizes and types of tools. While the greater portion of the inquiries were for replacements some of them indicated an intention of business expansion.

Factory production was maintained during the week at practically the same point as it has been, and it is thought that incoming orders will maintain it at this point until the market becomes more active.

Chicago

The inactivity which characterized the machine tool market during the latter part of June has to some extent been offset by the better demand which has prevailed since the first of July. The machinery business is by no means brisk, but there is sufficient being done to insure a good month.

General industry is providing most of the business at present reported, the demand coming chiefly from surrounding states, although inquiries are being received from the South. Railroad buying seems to have come almost to a standstill for the present. The Illinois Central, Rock Island and Santa Fe roads are the only ones which have done any recent buying, and their requirements have been limited to a few single tools. The month of June showed to perhaps a little better advantage than May in the volume of sales recorded.

Business for the next two months is not expected to average above previous years, experience having shown that production in practically all lines of manufacturing industry slows up during the vacation period. Taken as a whole, the machinery market is in fairly good shape, and the opinion is almost unanimous among dealers that a satisfactory increase in the demand for all lines of tools will materialize about the beginning of fall.

Indianapolis

Machinery and machine tool dealers and manufacturers in this territory just about held their own in trade volume during the last two weeks. Indicative, however, of the optimism which pervades the industry, plants were closed only one day following the Fourth holiday and production seems to be maintained in the manufacturing plants at about the same rate as the last two months. Insofar as machine tools go, sales might be considered active. The individual orders do not call for large amounts, but there is an activity in the trade that is encouraging.

One disappointing feature is the general lack of railroad buying in this territory. Repair schedules seem to be cut to a minimum and some small shops are being closed in an effort to concentrate repair work in large centers.

Business in garage machinery continues good, with grinding machines, small lathes and similar machinery moving readily. Some demand is noticeable now from the furniture factories for specialized wood-working machinery, but this demand is hardly as brisk as it was at the same time last year. Business is reported good at the midsummer furniture shows and it is probable many factories will make installations soon.